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IDA - FEMA - DoD RESOURCE PREPAREDNESS SEMINAR ONE

Volume II: Appendices

James S. Thomason, *Seminar Coordinator*

May 1994

Prepared for
Office of the Under Secretary of Defense for Policy

INSTITUTE FOR DEFENSE ANALYSES
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INSTITUTE FOR DEFENSE ANALYSES
Contract MDA 903 89 C 0003
Task T-K6-681

PREFACE

This two-volume draft paper is a transcript of the first seminar in a planned series of six held in 1992 and 1993 on Resource Preparedness. The statements and comments do not necessarily represents the views and opinions of the Institute for Defense Analyses, the organization represented by any speaker, or any department or agency of the United States government.

Volume I consists of a summary of the seminar followed by a transcript of the proceedings. Volume II contains the appendices, including the figures and viewgraphs accompanying each presentation as well as the agenda and list of participants.

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APPENDIX A
SEMINAR AGENDA

AGENDA

IDA-FEMA-DoD RESOURCE PREPAREDNESS SEMINAR ONE

Friday, February 21, 1992, 900 am

Institute for Defense Analyses, Bd. Rm, 1801 N. Beauregard St., Alex., VA

900	Welcome to Seminar Series (Dr. Jim Thomason, Mr. Joe Moreland, Mr. Joe Muckerman)
	Administrative Coordination (Mr. Fred Breaux)
915	Overview of First Seminar and Introduction of Speakers (Dr. Jim Thomason, Mr. Harrell Altizer)
925	First Industry Speaker: Mr. Horace Auberry, WellCo Enterprises
955	Second Industry Speaker: Mr. Glen Ailshie, SoPakCo
1025	Recess and Refreshments
1035	Third Industry Speaker: Mr. John Novak, Raytheon Corp.
1105	Fourth Industry Speaker: Mr. Lane Bonner, Siebe North Co.
1130	Recess
1135	Fifth Industry Speaker: Mr. James Miller, Survival Technology Co.
1205	Sixth Industry Speaker: Mr. Jon Campbell, Grumman Melbourne Systems
1235	Discussion of Next Steps, Summary, Recommendations (Dr. Jim Thomason)
1250	Closing Remarks (Mr. Joe Muckerman, Mr. Joe Moreland)
100	Adjourn for Buffet Lunch in Bd. Rm.at IDA

APPENDIX B
PARTICIPANT LIST

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APPENDIX C

FIGURES AND PREPARED NOTES

FIGURES AND PREPARED NOTES

This appendix contains the prepared notes, outlines, figures, and viewgraphs submitted by the industry speakers as a part of their presentations. All figures are referenced in the transcript in Volume 1. Note that Mr. Ailshie's comments (Appendix C-2) refer to the questions submitted to the speakers prior to the seminar. They are, therefore, not directly referenced to the transcript. Mr. Auberry's and Mr. Bonner's comments Appendix C-1 and C-4, respectively) were submitted in textual format but have been edited by IDA into the figure/slide format included here.

Appendix C-7 contains the viewgraphs accompanying Mr. Novak's complementary briefing given after the close of the seminar. The transcript (Volume I) does not contain Mr. Novak's briefing comments but the viewgraphs are included here for the reader's background and information.

APPENDIX C-1

MR. HORACE AUBERRY

WELLCO ENTERPRISES, INC.

Wellco Who?
• Shoes • Shoe machinery • Shoe manufacturing Technology • $30,000,000 public company • Technically a large business

Figure C-1-1

Wellco's Defense Role
• Manufactures combat boots • Develops combat footwear • Makes specialized machinery • Licenses to competitors • 65% sales direct to D.O.D. • 20% D.O.D. related • 15% Other • 15% Export

Figure C-1-2

Events - July '90
• C-3 Contract awarded May 90 - Minimum sustaining rate - 1200 pair per day, 1/3 capacity - All leather combat boot - 32 hour average work week • Desert Boot Development - 1989 U.S. Army Natick contract - General Schwarzkopf initiative - 80 pair in field test

Figure C-1-3

Events - August, 1990
• No panic • Good depot inventory position, jungle and combat boot • Use jungle boot for Desert Shield • Commence contract action for new jungle boot • Desert Boot Development - Additional prototypes to Natick

Figure C-1-4

Events - September, 1990
•• Desert Boot Development • Quick fix decision - Jungle boot pattern - Change to tan - Eliminate steel plate and vent eyelets - Spec changes developed

Figure C-1-5

Events - October, 1990
• C-3 contract for new black jungle boot • Now need jungle boot due to high mobilization use • Two options exercised on jungle boot • 67% of total contracts converted to new desert boot

Figure C-1-6

Events - November, 1990
• Panic - all out acceleration - DPSC week-end call - Overtime - Air freight - Premium payment to subcontractors, etc. - Wellco commitment - 3,000 pair per day by February - Significant shipments in December - Rush one pair size 11 1/2R for General Schwarzkopf

Figure C-1-7

Events - December. 1990
• General Schwarzkopf unhappy - Boot procurement paralyzed - Industry given one week to respond - General chooses Wellco ND914 from nine submitted

Figure C-1-8

Events - December. 1990 - January 15. 1991
• Tech data contract with Natick - 103 sizes of patterns • 184 pair confirming test boots produced • ND914 procurement - Tech data to DPSC January 13th - Solicitation January 14th - Letter contract January 15th - Decision to continue full speed on first model - Convert to new model as soon as practical - Wellco first shipment 5000 pair January 15th

Figure C-1-9

Wellco Overall Performance
• From 1,200 pair per day to 3,000 in three months • Barely made commitment overall • Ahead December and January • Slightly behind February and March

Figure C-1-10

Hampered by
• Labor only bottle neck • Introduction of three new items in as many months

Figure C-1-11

Industrial Preparedness Measures
• C-3 MSR contract in place • New C-3 in October short-cut procurement • Use of existing options allowed immediate procurement

Figure C-1-12

DPSC - Natick Co-Operation and Performance
• General S boot one month from prototype to procurement • Normally two years • Phone approval of minor deviations

Figure C-1-13

Downside
• Chaos • Letter contracts • Cost plus attitude creates lasting inefficiency • Getting paid in the aftermath - $1.012.000 for acceleration - agreed - no interest - 1.092.000 computer clin mix-up, interest - 663.000 mods - mostly agreed - no interest - 70.000 between bill/final price - no interest

C-1-14

APPENDIX C-2

PREPARED NOTES

MR. GLEN AILSHIE

SOPAKCO

Below is information provided in response to the questions for discussion purposes:

1. **Did you experience any difficulties in maintaining or increasing production of military items during Desert Shield/Storm because of laws and regulations at the local, state and federal levels?**

SO-PAK-CO was able to ramp up to required quantities without any delays caused by laws or regulations.

SO-PAK-CO presented a plan to DPSC at a scheduled meeting on November 9, 1990 to support ODS. This plan included various deviations to the specification to increase production, immediate acceleration of all existing contracts and our plan to produce 2.1 mm cases/month which complied with our Industrial Preparedness Plan.

The Government was unable to furnish ample GFM to support 2.1 mm cases and therefore requested our plan be revised to 1.3 mm cases/month. This is an increase in excess of 7 times our normal production during peacetime. In addition to this figure, SO-PAK-CO was scheduled to produce in excess of 11mm retort pouches a month at our two processing facilities.

It was necessary for SO-PAK-CO to make various building improvements and acquisition of equipment, to meet this immediate surge requirement, as follows:

Additional ramps to accommodate the thirty six trucks a day we would be shipping out at our maximum production level.

Refurbishing warehouses to meet Government standards throughout Mullins in order to have ability to receive the 25-30 trucks of incoming product on a daily basis.

Re-design the final assembly operation in order to give a more efficient run at this higher speed and to make room for the additional lines which would be set-up to comply with 60,000 cases a day.

At the assembly facility, SO-PAK-CO also vacuum packs crackers. We receive the crackers in bulk as GFM and are required to vacuum pack these items. In order to increase from a level of 102,000 cracker packs/day to 720,000 packs/day we enlarged our cracker facility and acquired additional machinery to meet the demands.

Increasing employment from 750 to in excess of 3,000 in order to meet this demand.

2. **Did the Government (at any level) help you by providing waivers, priorities, etc?**

During our meeting on November 9th, SO-PAK-CO presented various deviations which would be necessary to meet the ramped-up requirement.

The Government was timely on most deviations requested. However, there were times when a delay on a deviation did cause delay in production. A recommendation would be to streamline this process and allow the Contractor go directly to Natick - the drafter of the specifications, along with the Contracting Officer.

Below is a sample of key requests presented in order to comply with the increased demand:

Priority was required on receiving trucks shipping out MRE's. Our contracts are FOB origin and therefore were Government furnished trucks. At our maximum scheduled capacity it was necessary to ship out production on a daily basis. Without DCAS-Atlanta meeting this schedule, a delay of two days would have shutdown our operation due to lack of storage space.

Code changes on the pouches to increase production.

Payment needed to be made within 10 days because of our extended cash flow, since approximately 30% of the components are Contractor Furnished Material.

Inspection of product needed to be performed immediately following production rather than the normal 24 hour time frame.

3. **From your viewpoint and experience, how should surge orders be handled in the future if increased deliveries of production items (military or civilian) are requested, or if a dormant product is resurrected?**

In regards to surge requirements it might be recommended to increase their stock level so when a surge/mobilization does occur it will not trigger off an immediate panic. By increasing these stock levels with a turn over no longer than three years, the surge would be more of a phase in type process.

As mentioned, SO-PAK-CO presented our detailed plan on November 9, 1990 with a price submitted the following week. DPSC felt that their only avenue was to award letter contracts which have caused SO-PAK-CO horrendous

experiences in the past and we have gone on record well before ODS that we would not be interested in a letter contract. A detailed audit along with negotiations carried over the next three months until we received a firm fixed price contract to start in April. In the meantime, however, SO-PAK-CO accelerated and met the production requirements as outlined in our November 9th meeting. SO-PAK-CO's plan which began by acceleration of final cases in November, would have resulted in producing more cases than our two competitors combined. During ODS the Government purchased "warehouses" of commercial products for support items at market prices. This was products which were not being purchased by the consumer. We need to review how we go about contracting during times of urgency, and maintain this industry in order to avoid these type of purchases.

4. **What can the Government (at any level) do to allow you to reach your maximum physical capacity, operating around the clock, within six, twelve or twenty four-months?**

In order for the Contractor to ramp up to maximum physical capacity, we first must be maintained during peacetime.

Meals, Ready-To-Eat (MRE's) are an essential component of our national defense. In order to create an industrial base, DoD encouraged several companies to invest in excess specialized equipment needed to produce MRE's. In return, the government has annually purchased a "sustaining level" of MRE's in order to maintain a mobilization capability.

Efforts to radically reduce MRE procurement could destroy this already fragile industry. DoD is proposing to cut FY 1992 MRE purchases to 1.2 million cases, a figure which is less than half of the annual rate prior to Operation Desert Storm. If this occurs, there will not be a MRE Industry available to support the necessary surge requirements we are discussing.

Operation Desert Storm underscored the need to maintain a strong industrial base for MRE's. The MRE suppliers and assemblers were able to respond quickly and effectively to the military's demand for food rations.

Following Desert Storm, the House of Senate Armed Services Committees recognized MRE's as one of several products considered by the Defense Department to be "war stoppers." The Committee noted in the FY 1992 Authorization Conference Report that:

> The experience of Operation Desert Storm underscores the importance of maintaining the production capability in the industrial base for critical items of military supply and material. During Operation Desert Storm a number of items were identified as potential "war stoppers," including ... Meals, Ready-To-Eat ... The Defense Department considers an item to be a war stopper if it is critical to carrying out the mission of the military services and has a large surge mobilization requirement, but peace-time buys are insufficient to maintain a mobilization capability. H.Rept. 102-311.

If the Government reduces its MRE purchases to the proposed level of 1.2 million cases, one or more of the three MRE assemblers will be forced out of business. This action will reduce the maximum potential MRE output for future mobilizations and put the Government in the vulnerable position of dealing with a single supplier for an essential war item, assuming that even one supplier could be maintained at this low rate.

We understand that DoD is resisting additional MRE purchases because of the overhang of unused MRE's from Operation Desert Storm. This is a short-term problem and it should not be dealt with in a manner which jeopardizes our long-term mobilization capability. Excess MRE's can be used as part of a variety of domestic and international humanitarian efforts, including the current effort to aid the former Soviet Republics.

The Government must establish a realistic minimum sustaining rate. In 1990, DoD completed a study which found that an annual procurement of 3.1 million cases was "insufficient to sustain the industry." In light of this information, it would be inappropriate to reduce annual MRE procurement below the 3.6 million case figure specified in the FY 1992 Appropriations Bill.

DoD should fully utilize MRE's during military training maneuvers. This action would not only boost peace-time MRE consumption, it would improve troop training and provide valuable feedback on the product.

DoD should also work with other agencies such as the State Department, FEMA, USDA, and HHS to identify appropriate on-going non-military uses for MRE's These uses might include domestic and international disaster assistance and emergency food support for the homeless.

5. **How can Industry and Government (at all levels) work together to accelerate production of existing items or to produce new systems when appropriate, for national security purposes?**

It is imperative, as mentioned above, that the base be protected. The MRE is a small and fragile industry and if the discussed cutbacks are incorporated the base for the MRE would be destroyed.

The Government and Contractors needs to work together and be more innovative in our current procurement system of MRE's. In 1985 and again in 1989 we proposed what we believe would be a innovative approach of buying rations, called the Total Systems.

APPENDIX C-3

MR. JOHN NOVAK

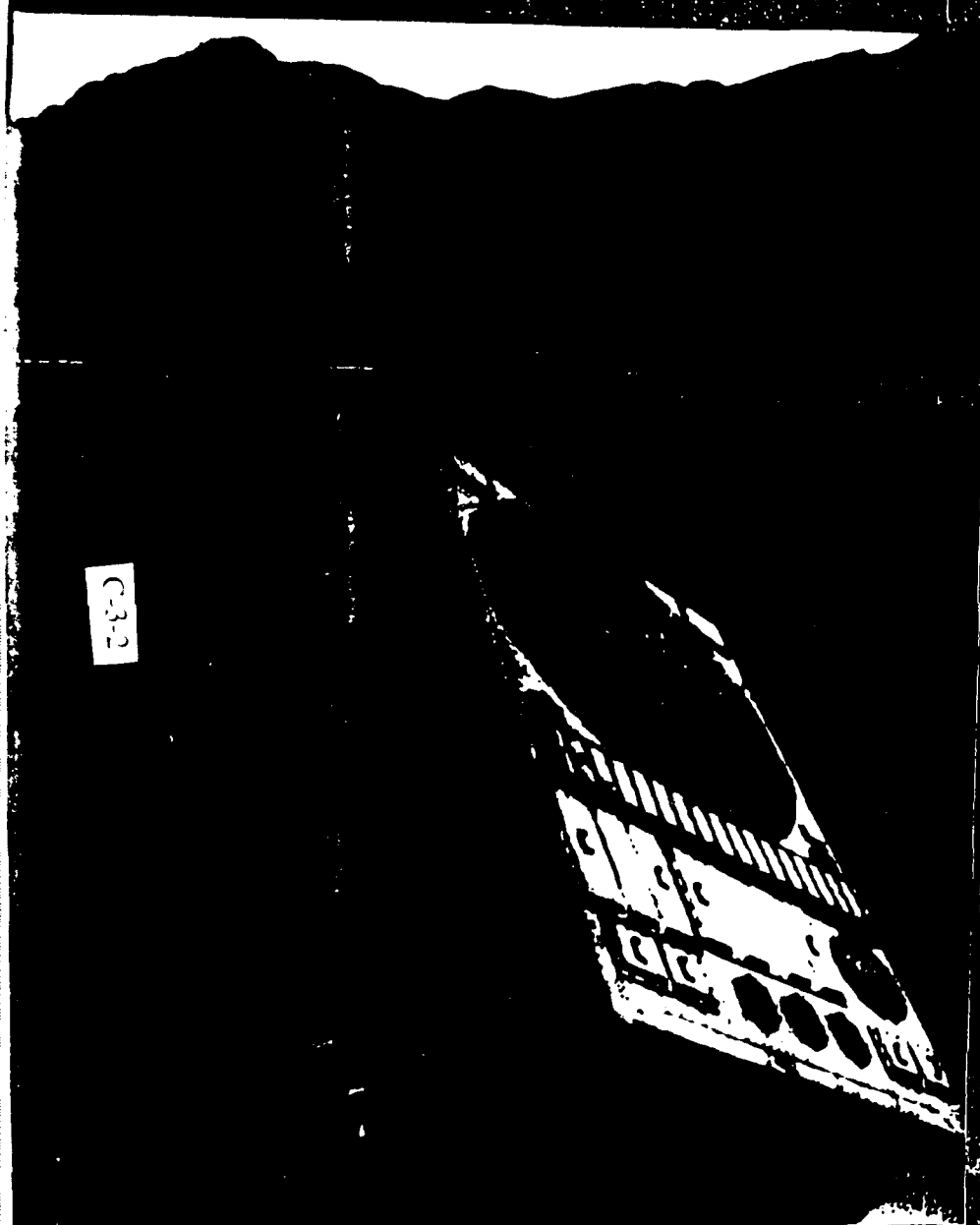
RAYTHEON

Raytheon

Patriot Presentation to Institute for Defense Analysis

21 February 1992

Figure C-3-1



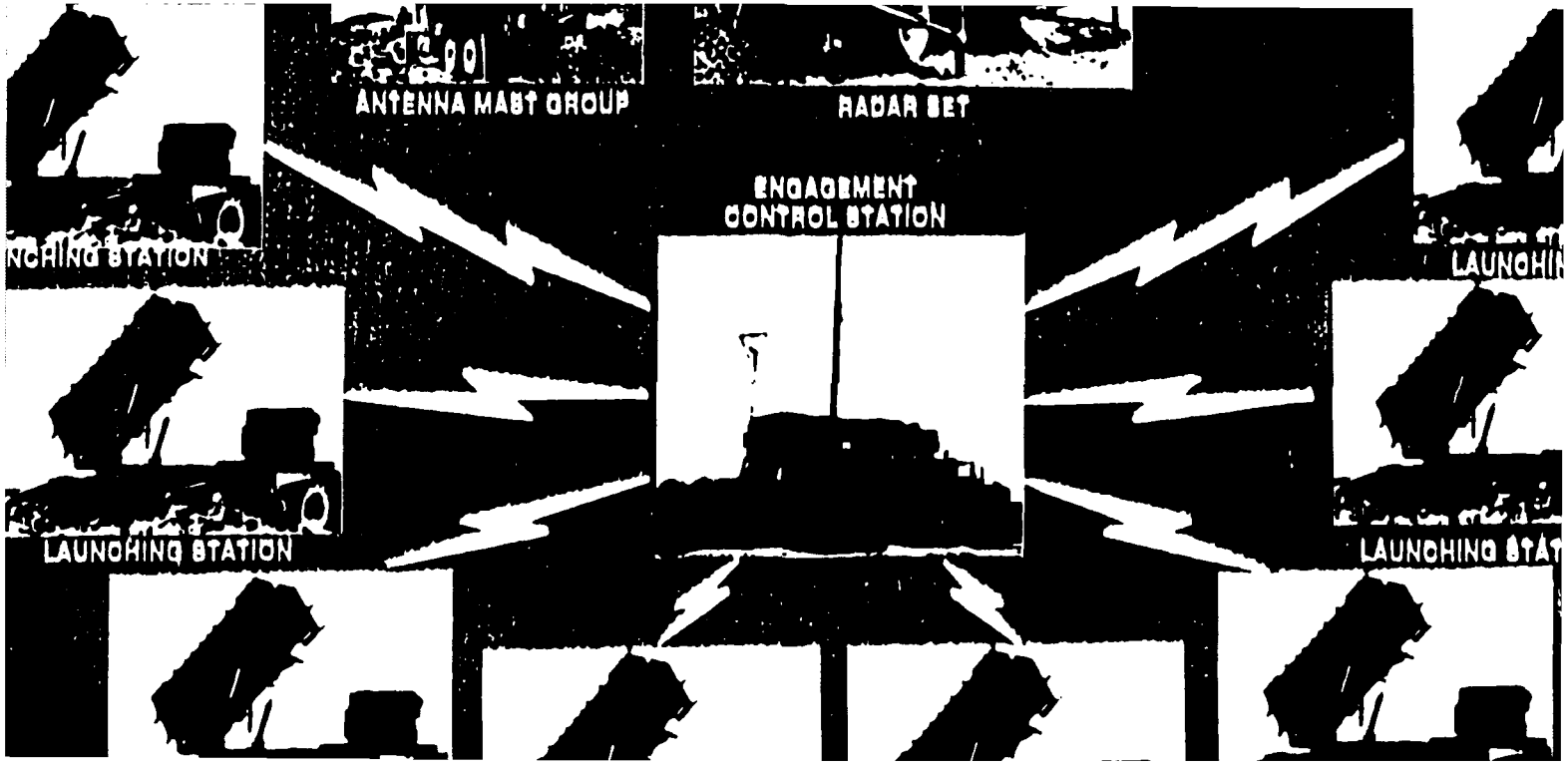
C-3-2

Patriot System Status

- Production
  - On or Ahead of Schedule
  - 125 Fire Units and 5400 Missiles Delivered
- Quality
  - Worldwide Readiness > 98%
  - Field Reliability > 2 Times Specification
  - Factory Reliability Acceptance 7 Times Specification
- Current International Programs
  - NL, GE, Italy, Japan, Saudi Arabia, Israel
- ATBM Capability
  - Deployed Worldwide
  - 17 of 17 Test Successes
  - Successfully Fought Difficult Wartime Threat in Desert Storm
- Growth Capability
  - Inherent Architecture Supports Significant Growth Against Air/TBM Threat

Figure C-3-2

P92-01-180
PA 1/10/91


ANTENNA MAST GROUP
RADAR SET
ENGAGEMENT
CONTROL STATION
LAUNCHING STATION
LAUNCHING STATION

Performance Validated

Raytheon

- Over 2,000 Search/Track Tests Over Full Envelope
- Over 200 Live Firings Over Full Envelope versus Aircraft Targets
- *17 for 17 Successful TBM Flight Tests*
- Multiple Successful Operational Tests in Europe and United States
- In Production Since 1980
  — Production Reliability More Than 7 Times Specification
- Deployed Since March 1985
  — Deployed/Operational Reliability More Than 2.5 Times Specification
- Combat Proven Against TBMs in Desert Storm in 1991

Patriot In Desert Storm

Raytheon

- Air Defense was a First Priority Along with 82nd Airborne
- Patriot - One of the First Assets Deployed
  - —The Only Existing ATBM Capable System
  - —Went by Priority C-5, C-141 Airlift and Sealift
- Defended Debarkation Air Fields, National Strategic Assets and Troops
  - —In Saudi Arabia, Israel and Turkey
  - —Most Units Placed in Fixed Positions
  - —Some Units Moved with Troops
- Patriot Saved Lives and Substantially Influenced the Course of the War
  - —≈ 90% Effective in Saudi Arabia
  - —A Little Less Than 50% Effective in Israel
  - —Outstanding Readiness of Equipment and People
  - —No Spare Parts Problems

Figure C-3-5

P91-08 585
DA 9/23/91

Accelerated Responses to Support Operations Desert Shield/Desert Storm

- Production Deliveries of ATM Capable (PAC-2) Missiles Accelerated 5 Months Earlier Than Original January 91 Requirement
  - 550 Missiles Delivered Before Start of Desert Storm

- New ATM Software Tested and Deployed 5 Months Ahead of Plan
  - From January 1991 Plan to August 1990 Fielding
  - Included Modifications to Handle Longer Range Threat
  - Flight Tests Conducted at WSMR Prior to Deployment

- Two Additional Software Changes Developed, Tested and Deployed During Desert Storm
  - Included Enhancements Based on Observed Characteristics of Threat

- 42 Raytheon Personnel Deployed to Theater for Training and Maintenance Support
  - 23 to Saudi Arabia / 15 to Israel / 4 to Turkey

- Spare Parts Supported on Demand Direct from Factory Floor
  - Demand was Light Throughout Desert Storm

Patriot Hardware and Software Accelerated for Desert Storm

Raytheon

- Raytheon Directed to Accelerate PAC-2 Missile Production Early August 1990
  - —Production Delivery Plan Moved from January 1991 to August 1990
  - —Committed to Deliver 420 PAC-2 Missiles by 1 January 1991
  - —Actual Missile Deliveries

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Commitment	—	95	185	303	420	601
Delivery	9	95	190	307	424	619

- Availability of Material was Key to Production Acceleration
  - —Raytheon and Vendors Had Material in Stock
  - —All Vendors and Subcontractors Were in Full Production

Figure C-3-7

P92 02-512
DA / 2/19/92

Key Factors Leading to Successful Acceleration of Patriot PAC-2 Missiles

- Teamwork: Project Office - Raytheon - Key Vendors
- Multiple Sources for Key Items
  - — Warhead
  - — Initial Warhead Assemblies were Constructed Utilizing Different Vendor Sub Assemblies
- U.S. Military, Commercial and Charter Air Transportation of Material
- Material Inventory Available

P92-02-505
2/19/92 jg

Threat Characteristics

Raytheon

	PAC-2 Design Threat	Pre-War Information	Actual Characteristics
TBM Range	INF Constrained (Less Than 500 km)	Longer (Able to Reach from Iraq to Saudi/Israel)	Same as Pre-War
TBM Velocity	Consistent with Range	Consistent with Range	Consistent with Range
Accuracy	Very Accurate (Predictable)	Inaccurate (Predictable)	Very Inaccurate (Unpredictable)
Slow-Down	Small/Predictable	Small/Predictable	Large/Unpredictable
Deviations Off Trajectory Path	None	None	Extensive
Effective Size (to Radar)	Moderate	Moderate	Small to Very Small
Warhead Vulnerability	Well Known	Assumed Same as Design Threat	Reduced
Other Objects	None	None	Many

Figure C-3-9

P91-11 502
DA 11/27/91

Theater Missile Defense Lessons Learned from Desert Storm

Raytheon

- In Place Production Base Is Vital for Required Surge Capability
- Patriot Hardware Reliability Resulted in Exceptionally High System Readiness
- Software Driven Systems Allow Quick Response to Unexpected Threat Characteristics
- The TBM Threat Is Real and Growing
  - — Can Inflict Severe Damage to Soft Targets, Such as Cities
  - — Accuracy is Unimportant When Used as a Weapon of Terror
  - — Active Defense is Critical Element of the Solution
- Improved ATBM Capability Is Highly Desirable
  - — Greater Lethality Against "Difficult" Threats
  - — Larger Footprint to Extend Area Protection / Provide Redundant Coverage
  - — Higher Intercept Altitude to Kill TBMs Farther Away from Impact Area
  - — More Flexible Launcher Placement to Protect Outlying Assets and Ease Employment
- Improved Deployability Is Highly Desirable
  - — Eliminate Dependency on C-5 Airlift
  - — Reduce Airlift Sorties and Setup Time
- Real Time Data Collection is Critical for Future Conflicts
- Troop Training Proved to be Excellent

Figure C-3-11

P91-11-488
2/19/92 jg

Summary

Raytheon

- Patriot Continues to Be a Model of Success for the U.S., Germany, the Netherlands, Japan and Israel
- Patriot is a Critical Element of U.S. Contingency Operations
  —Is Multithreat Capable (A/C, TBMs, CMs) to Provide Flexible Defense with a Common System
- Near Term ATBM Growth is Focused on Quickly Fieldable Patriot Improvements
- Longer Term Improvements Integrate SDI's Theater Missile Defense Activities with Patriot P^{3}I
  —Patriot Provides the Lower Tier of ATBM Defense Plus Aircraft and Cruise Missile Defense
- A Warm Production Line is Critical to Production Surge Capability

Figure C-3-12

Acceleration Difficulties Due to Laws and Regulations at the Local, State, and Federal Levels

- Restrictions Upon Shipping Explosive Materials

Solution: Locate Certified Explosive Carriers

P92-02-506
2/19/92 jg

Figure C-3-13

Government Support by Providing Waivers, Priorities or Other Help

- Minor Waivers were Presented and Approved by Patriot Project Office
  - — Quality and Reliability were Never Compromised
- Major Waiver to Documentation Baseline was Approved to Permit Retrofitting of Existing Missile Rounds in Inventory
- Priorities for Military Aircraft for Shipping Missile Forebodies to Germany
- Locating and Providing Use of Government Owned X-Ray Machine for Warhead Inspection

P92-02-507
2/19/92 jg

Figure C-3-14

Government Handling of Surge Orders

Raytheon

- Contractual Direction - Immediate
- Define Customer - Contractor Team Players

P92-02-508
2/19/92 jg

Figure C-3-15

Government Actions to Allow Contractor to Reach Maximum Capacity

- Maintain a Warm Production Baseline
- Assist in Identifiying Unique Fabrication Processes and Maintain Capability
- Assist in Identifying Sole Source Vendors for High Technology Items and Maintain Technology

Figure C-3-16

P92-02-509
DA 2/19/92

Government/Industry Cooperation to Accelerate Production for National Security Purposes

- Working Together to Identify Systems That May Need to Be Accelerated in the Future
- Identify and Maintain Fabrication Process Capability
- Identify and Maintain Unique High Technology Items
- Identify and Maintain Inventory of Long Lead Material

Figure C-3-17

P92-02-510
DA 2/19/92

APPENDIX C-4

MR. LANE BONNER

SIEBE NORTH, INC.

- *2 August 1990* - Iraqi forces invade Kuwait.

  Comments: Like other defense contractors, we speculated that the U.S. would become involved, and that we might eventullay be asked to provide accelerated product delivery.

- *1 September 1990* - (Approximately) DPSC commenced weekly and monthly verbal requests for up-to-the minute production and shipping schedules.

- *29 October 1990* - DPSC rountely issued a new solicitation for an annual MSR procurement/contract.

  Comments: Because of the necessity of correcting certain errors which we detected in the specification, the bid closing was extended from 13 November to 20 November.

- *9 January 1991* - Effective date of the award of contract DLA100-91-C-4064, although not signed by the contracting officer until 1 February 1991. Contract was for 827,148 pairs of chemical protective gloves.

  Comments: Although boldly hand-lettered with a "DESERT STORM" legend across the top of page 1, this contract included the usual clause, "Acceleration of delivery is permitted only as authorized by the procuring contracting officer." (This was typical, since these contracts are of the MSR type.) First delivery was due at destination 60 days after award.

- *16 January 1991* - Air offensive began.

  Comments: Still no request for accelerated production.

- *1 February 1991* - DPSC issued Solicitation DLA100-92-R-0205 for a total of 708,408 pairs.

  Comments: Clearly, this was planned as an exigency procurement:

  1) Rubber-stamped with "DESERT SHIELD" (sic) legend.
  2) Offers due only 7 days after issuance of the solicitation.
  3) Acceleration of delivery permitted.
  4) Delivery to be completed in four monthly increments. "Liquidated Damages" (penalty) for late deliveries.

- *24 February 1991* - Ground offensive began.

- *28 February 1991* - Cease-fire became effective (at 8:00 A.M. Riyadh time).

  Comments: At no time between receipt of offers (8 February) and the end of the war was there any indication that a contract was about to be awarded, nor was there the customary request for "Best and final" offers.

- *17 April 1991* - Offerors submitted "Best and final" offers on the "exigency" procurement.

- *10 May 1991* - Award made (as modification to existing contract DLA100-91-C-4064).

  Comments: We immediately took steps to increase production. Additional personnel required for 3 shift versus 1 shift production were hired, trained, and put to work.

- *6 July 1991* - Contracting Officer ordered accelerated production stopped, remaining unproduced quantities to be delivered at MSR rate upon completion of basic contract.

Figure C-4-1. Chronology Desert Shield/Storm - Siebe North, Inc.

- DoD was extremely slow in assessing its potential additional needs for chemical warfare gloves. By the time it did so, the war was nearly over.
- When an exigency procurement was finally promulgated, the products to be provided would have only become available at a date after General Schwarzkopf's "worst case" estimate of a 60 day ground war - even if a contract had been promptly awarded.
- The defense procurement process - at least at DPSC - is so hampered by process, regulation, and lumbering pace, that it seems almost incapable of decisive action.

Figure C-4-2. Conclusions: *Desert Shield/Storm - Siebe North, Inc.*

We were not (and would not have been) hampered in increasing production because of laws and regulations at local, state, and federal levels.

Figure C-4-3. Effect of Laws and Regulations

The government did not help us, but could have done so, by providing waivers, priorities, etc:

a) It could have rescinded the prohibition against acceleration deliveries.

b) It could have employed the Defense Priorities Allocations System (DPAS) to good use by assigning a higher priority (DX), and/or by reminding contractors and subcontractors of their DPAS obligations.

c) It could have prioritized government laboratory testing of our products. (Pre-shipment samples are tested for war-agent permeation resistance at Aberdeen Proving Ground. A contract clause allows 30 (working) days for such testing; it is currently taking about 70 (calendar) days; and the testing actually could take less than 2 (working) days, including sample preparation, paperwork, etc.)

Figure C-4-4. Possible Government Help

From our viewpoint and experience, surge orders in the future could be better handled in several ways, all involving better planning and preparation.

a) The contracting activity should be required to have developed an approved exigency procurement plan for every key item.

b) Every "MSR" type contract could require mandatory acceptance of an exigency procurement clause (what's one more clause!). Such a clause could be rather simple and straightforward, with a conditional price not to exceed a predetermined level, the final price to be negotiated at a later date.

Figure C-4-5. Future Improvements

We could reach our maximum physical capacity, operating around the clock, within 6-9 months (or less) without government help (based on present circumstances).

Figure C-4-6. Time Reach Capacity

The procurement process today is one primarily conducted by arm's-length formalities - as if between opposing lawyers in divorce court. "Cooperation" and "Work together" almost seem to be foreign words and phrases. (Having said that, it is equally important to note that our relationships at DPSC with the Contracting Officer and his assistant could hardly be better, to the extent that a formalized process permits. It is thus the "system" we criticize.)

Figure C-4-7. Government/Industry Relationship

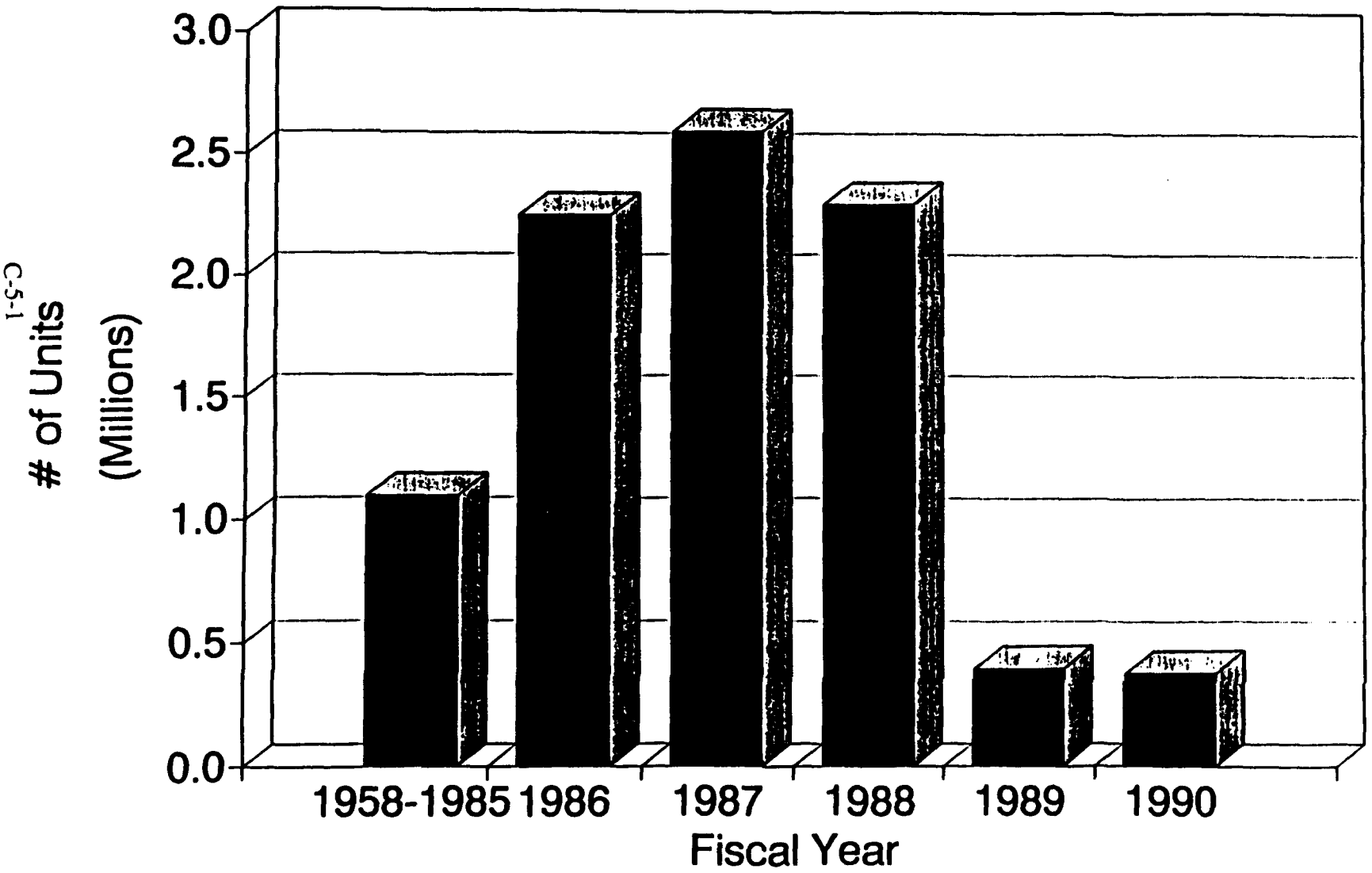
APPENDIX C-5

MR. JAMES MILLER

SURVIVAL TECHNOLOGY, INC.

DoD Production

Survival Technology, Inc.

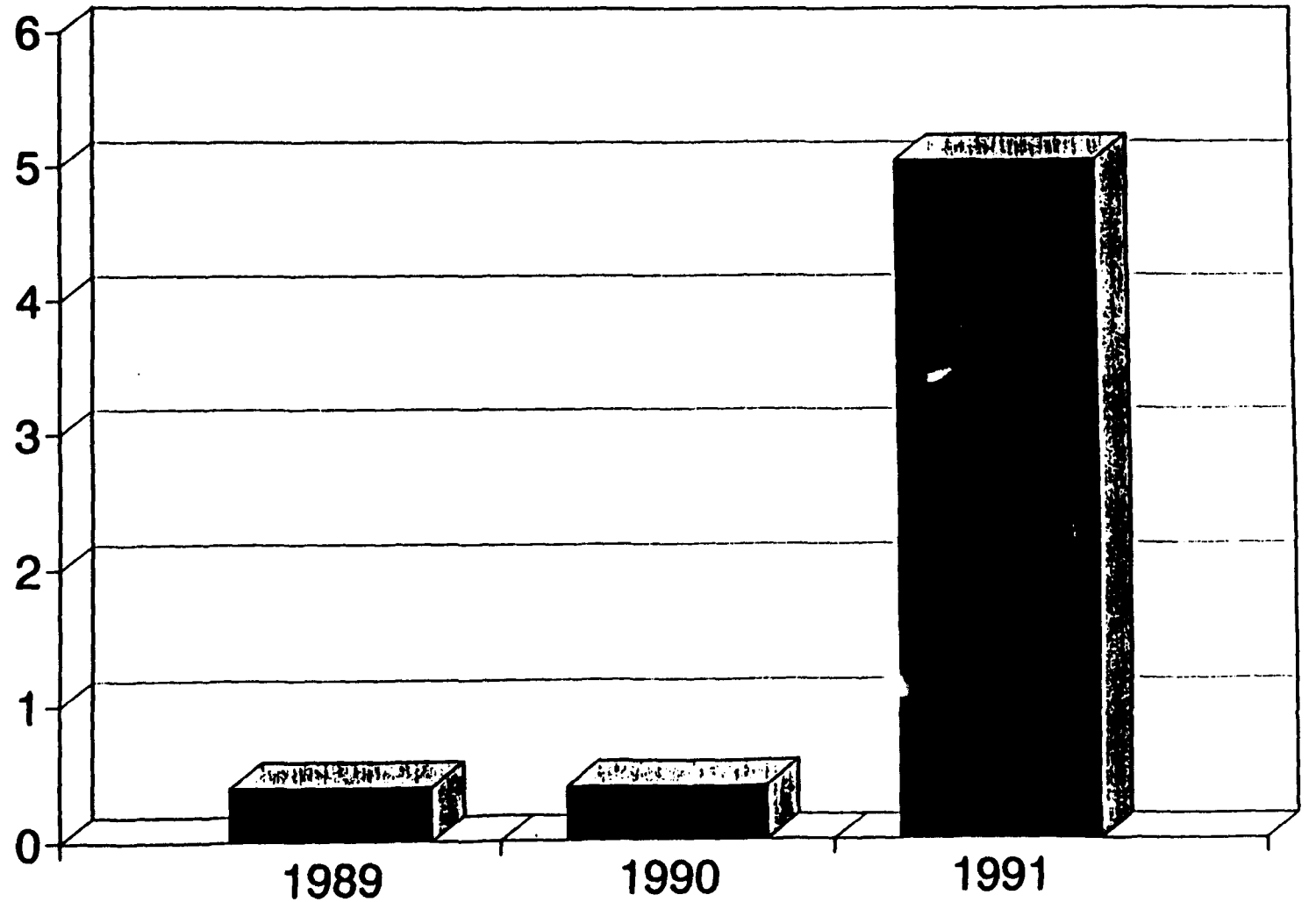


C-5-1

Figure C-5-

Desert Storm Scale-Up

Survival Technology, Inc.



Auto-Injector Deliveries
Desert Shield/Storm

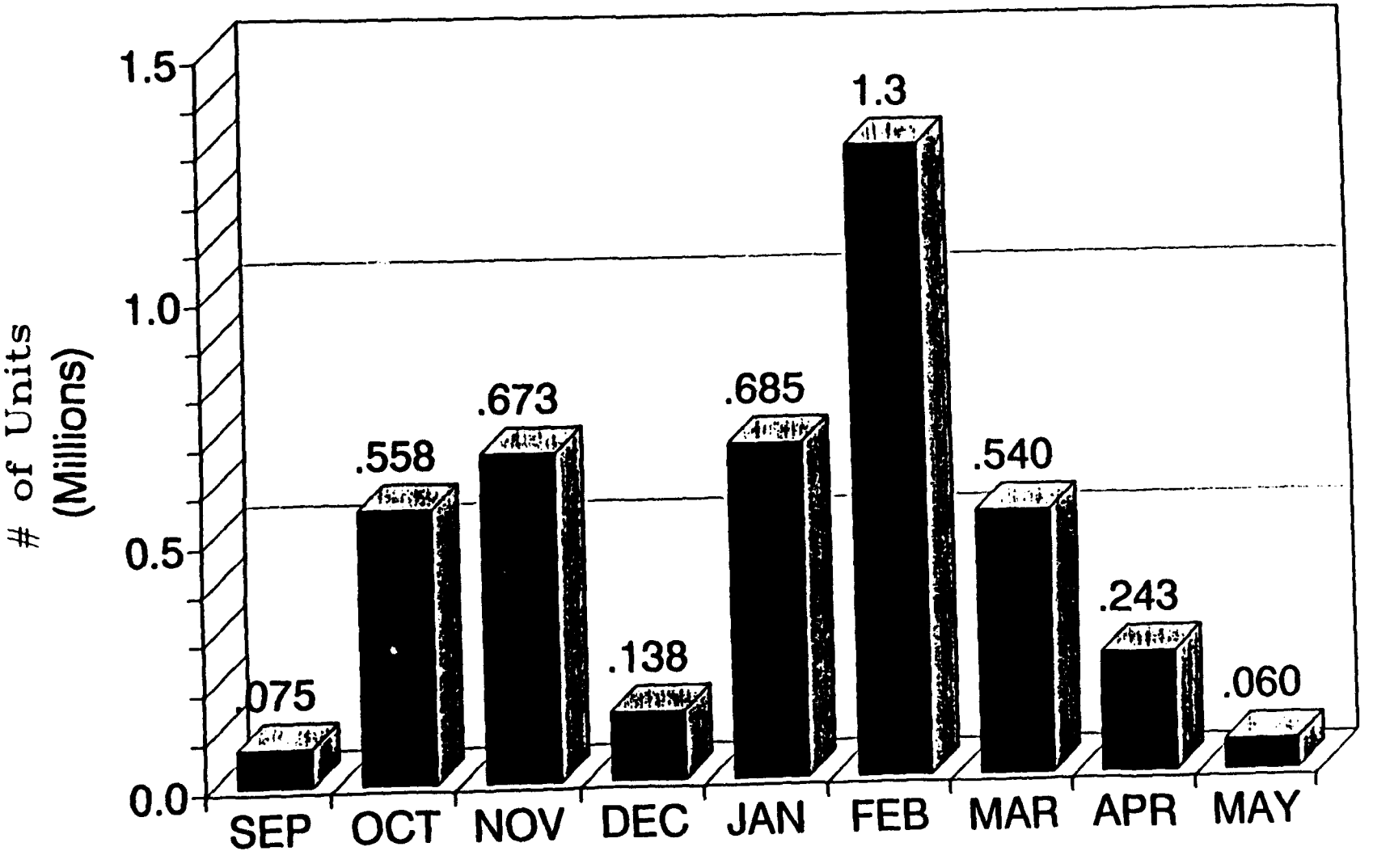


Figure C-5-3

Direct Labor Employees
DoD Production

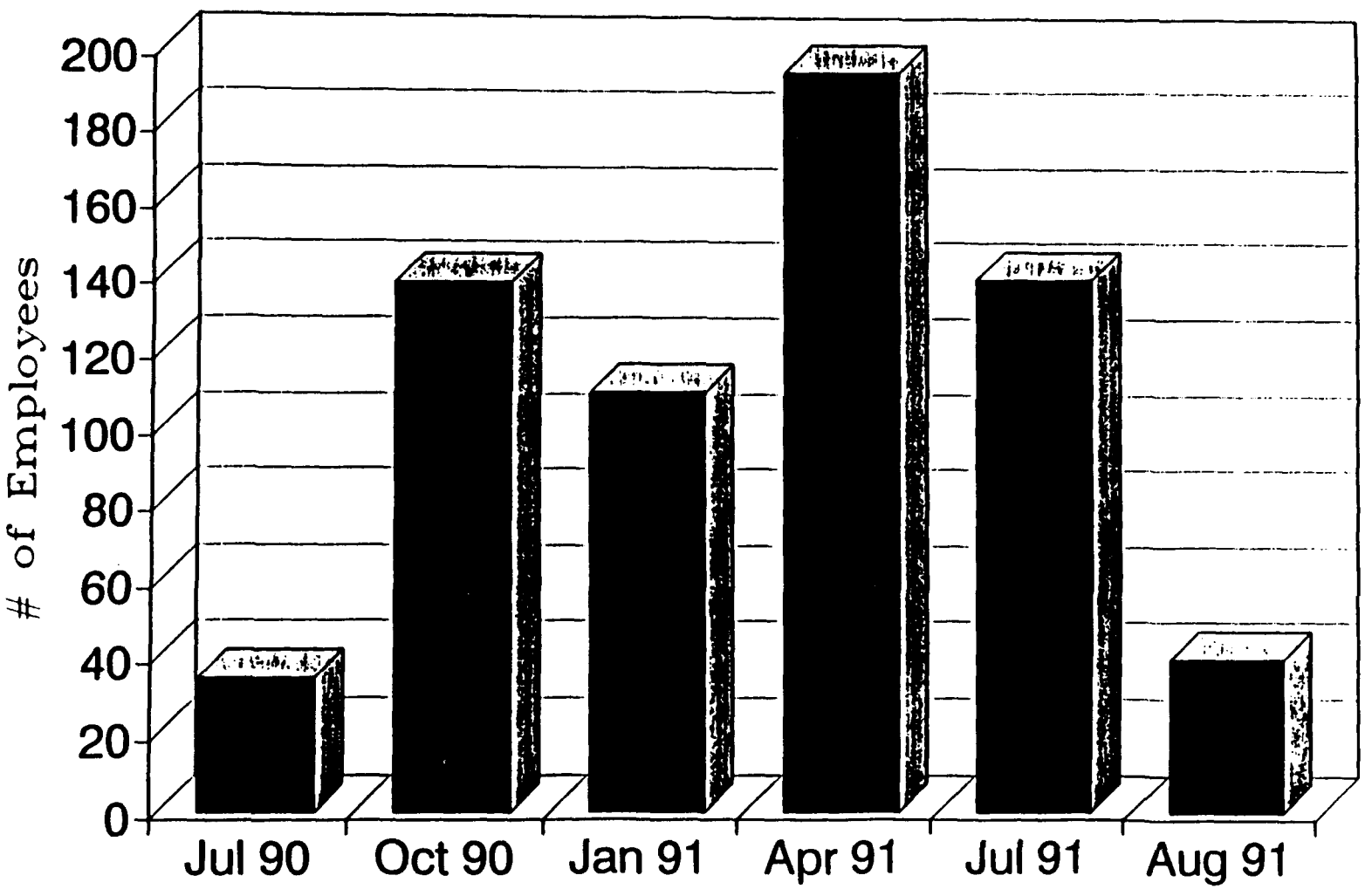


Figure C-5-4

LESSONS LEARNED

- PreStocking/PreStaging of critical components and raw materials necessary to insure enhancement and sustainability of "Surge" requirements.
- Stand-by production equipment, molds and special tooling, coupled with alternate sources of supply, must be established and maintained.
- Increased automation will enhance/insure capability to meet "Surge" requirements.

Figure C-5-5

EFFECTS OF COLD INDUSTRIAL BASE
Prime and Sub Tier

- Extended Component Lead Time
- Lack of Trained Labor Force
- Deterioration of Equipment and Facilities
- FDA/GMP Implications
- Longer Production Start Up
- Significant Costs

Figure C-5-(

HOW CAN GOVERNMENT & INDUSTRY WORK TOGETHER

- Maintain On-going Dialogue
- Prior Planning
- Commercialize Non-critical Specifications
- Best Value Procurement
- Multi-year Funding/Contracting
- Identify Alternative Markets for Auto-injectors

Figure C-5-7

POTENTIAL NEW MARKETS

- Chemical Weapon Demil. Program
- FMS to Allied Foreign Governments for Protection of Military/Civilian Populations

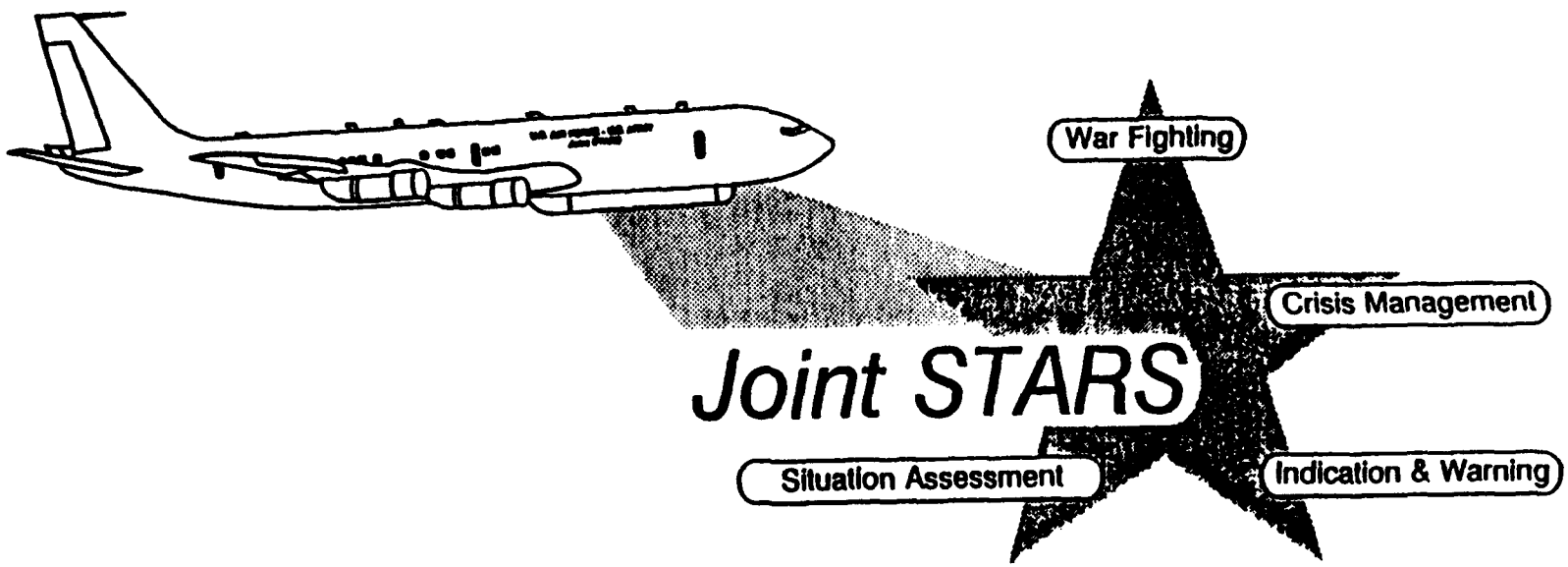
Figure C-5-8

APPENDIX C-6

Mr. JON CAMPBELL

GRUMMAN CORP.

Operation Desert Storm Briefing



C-6-1

Grumman Melbourne Systems Division

R984.A01 19MAR91 FRANK/CD

Figure C-6-1

Desert Storm Preparation

[redacted] Figure C-6-2

Deployment Orders

Notification: 17 December, 1990

Orders: Deploy two developmental Joint STARS aircraft, trained crews, spares & support equipment within 30 days

Pre-Deployment Tasks

- Both aircraft updated to 8.3 & initial sensor 4 capability
- OFD baseline performance re-established & tested on both aircraft
- Air Force flight crews trained
- In-flight refueling qualified for KC-10 tanker
- Additional capabilities & features to improve operational effectiveness added to both aircraft
  - ECCM
  - Backup UHF
  - Long-range SCDL
  - Enhanced SAR
  - HAVE QUICK
  - JIDS installation
  - Other misc capabilities

Figure C-6-4

[redacted]

Pre-Deployment
Integration & Test Flight Record (17 Dec 90 - 9 Jan 91)

- Total Flights 19
  - Engineering
  - Training
  - Air Refueling
- Total Hours 88.5 hr
- Average Flight Hours 4.6 hr

Preparation Summary

- All pre-deployment tasks accomplished

- Both aircraft, all equipment & crews launched by 11 January **- In Only 25 Days**

Figure C-6-6

E-8A Desert Storm Operations

Figure C-6-7

Joint STARS Aircraft Operations

- Two E-8As deployed 11 January, air-refueled enroute, arrived Riyadh, 12 January
- Daily sorties began 14 January, combat sorties began 17 January
- Flying one aircraft each day
- Operational missions averaged 10.5 hours
- Flying dusk to dawn

Figure C-6-8

[redacted]

System Performance

- System performance exceeded expectations
- MTI performance against tactical/operational targets was excellent
- SAR performance at long range was excellent & valuable asset in providing targeting to the Air Force & Army

Deployed Contractor Personnel

Grumman - 41

- Mission Crew
- Data Analysis
- Ground Engineering
- PME & GSE Maintenance
- Logistics Management

Norden - 6

- Mission Crew
- Sensor Ground Engineering

Greenwich Air Services - 15

- Aircraft Maintenance

CUBIC - 2

- Army GSM Field Support

PAR - 1

- Mission Crew

65 - Total In-Country

21 - Additional Rotation Personnel

Figure C-6-10

ILS Maintenance Status

Sorties Scheduled	54
Sorties Flown	54
Average Duration	10.4 hr
Air/Ground Aborts	4/3
Breaks	5
Average Fix Time	3.8 hr**
FMC Rate	80.2%
One Aircraft Availability Rate	90.1%
MC Rate	80.2%
NMCM Rate	9.9%*
NMCS Rate	9.9%

* NMCM rate includes engine change (no QEC kit): 445 manhours

** Does not include engine change

Figure C-6-11

Joint STARS - Desert Storm Operations
Status as of: 4 Mar 91

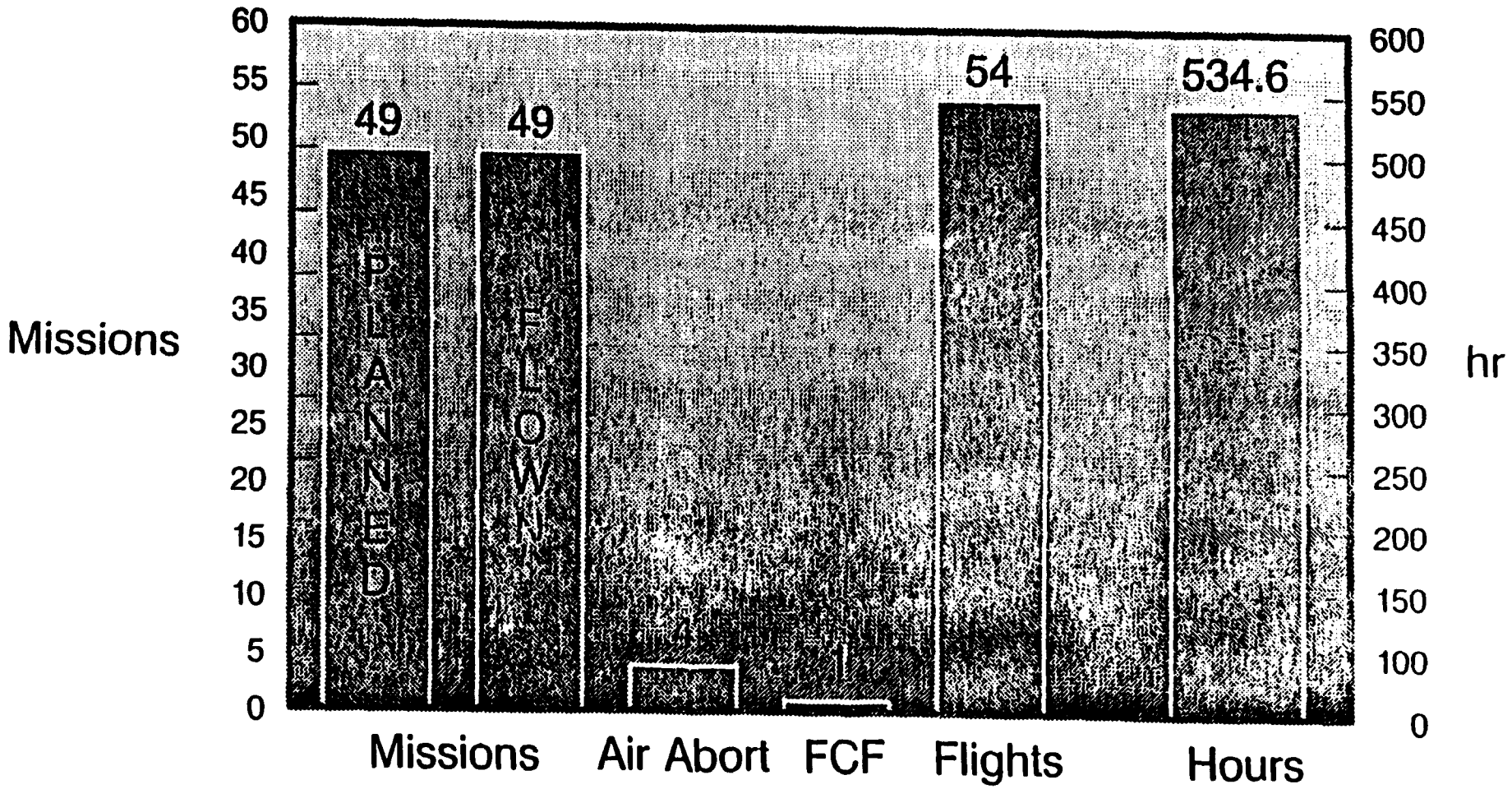


Figure C-6-12

JOINT STARS
DEPLOYMENT HISTORY

GRUMMAN

- EARLY LOOK DEPLOYMENT
  - RAF MILDENHALL, U.K.
  - ONE E-8A AIRCRAFT, FORTY CONTRACTORS
  - TEN DAYS
  - FOUR FLIGHTS
  - FEBRUARY 1990

- OPERATIONAL FIELD DEMONSTRATION
  - RAF MILDENHALL, U.K.
  - GEILENKIRCHEN AIR BASE, GE
  - RAMSTEIN AIR BASE, GE
  - BRETIGNY-SUR-ORGE AIR BASE, FR
  - ONE E-8A AIRCRAFT, FORTY-FIVE CONTRACTORS
  - SIX WEEKS
  - SIXTEEN FLIGHTS, GROUND DEMOS ON OFF-DAYS
  - SEPTEMBER-OCTOBER 1990

Figure C-6-13

DISCUSSION TOPIC ONE
DIFFICULTIES BECAUSE OF LAWS OR REGULATIONS

GRUMMAN

- NO MAJOR PROBLEMS
- MELBOURNE CIVILIAN AIRPORT RESTRICTIONS
  - NIGHTTIME ENGINE RUNS
  - WET RUNWAY RESTRICTIONS
  - FLEW NEW YEARS EVE
- FAR REGULATIONS - COST & PRICING
  - SHIFT TO COMMERCIAL CONTRACT TERMS
  - COST IMPACT
- RULES
  - DO/DX RATING
  - PASSPORTS, TDY ORDERS, CHEMICAL WARFARE TRAINING
- CONTRACT ANTICIPATION - INSTANT COST PLUS
  - RISK TAKING
  - PHASED AUTHORIZATION
    - -- PRE-DEPLOYMENT
    - -- DEPLOYMENT
  - SUBCONTRACTORS
- ANTICIPATED THE CALL
- LEARNED FROM EARLY LOOK AND OFD

Figure C-6-14

DISCUSSION TOPIC TWO
GOVERNMENT HELP WITH WAIVERS, PRIORITIES, etc

GRUMMAN

- TEAM JOINT STARS EFFORT
- ESTABLISHED CONUS COMMAND POST

Figure C-6-15

CONUS COMMAND POST

GRUMMAN

- MISSION:
  - SUPPORT 4411 JOINT STARS SQUADRON
- TEAM STRUCTURE
  - USAF COMMAND POST CONTROLLER (24 HRS)
  - GRUMMAN PROGRAM MANAGER (2)
  - COMMAND POST CONTROLLER (24 HRS)
  - PME MANAGER (SUPPLY OPS) (2)
  - MATERIAL MANAGER (2)
  - AIRCRAFT LOGISTICS MANAGER (24 HRS)
  - 4411 JOINT STARS SQUADRON LOGISTICS MANAGER
  - PROCUREMENT MANAGER
  - FAMILY SUPPORT MANAGER
  - SECRETARY
  - THREE OFF-SITE EXPEDITORS
- PHONES, FAXES, COMPUTER TERMINALS
- DAILY COMMUNICATION WITH 4411 JOINT STARS SQUADRON

Figure C-6-16

CONUS COMMAND POST
RESUPPLY OPERATIONS

GRUMMAN

- IN-COUNTRY REQUESTS TO COMMAND POST
- COMMAND POST
  - NOTIFY IN-HOUSE ACTIONEES
  - POST AND MAINTAIN STATUS
  - REQUEST SHIPMENT CLEARANCE FROM USAF
- USAF AIRLIFT CONTROL AGENCY, WRIGHT-PATTERSON, AFB
  - SHIPMENT AUTHORIZATION
- COMMAND POST
  - COORDINATED SHIPMENT TO CHARLESTON OR DOVER
  - FORWARDED INFORMATION TO 4411 JOINT STARS SQUADRON
- CHARLESTON - DESERT EXPRESS
  - DAILY FLIGHTS
- DOVER
  - DAILY FLIGHTS
  - JOINT STARS PRIORITY WAS 48 TO 84 HOURS

Figure C-6-17

DISCUSSION TOPIC TWO

GRUMMAN

- USAF IN COMMAND POST - SHIPPING AUTHORIZATION
- DESERT EXPRESS (CHARLESTON AFB, S.C.) OR DOVER AFB, DE
  - EXPEDITERS TDY
- FOREIGN SOURCES (CANADIAN & BRITISH)
  - WAIVED ENTRY PROTOCOL
- BOX MARKINGS
  - JOINT STARS STICKERS
- PASSPORT PROCESSING
  - SAUDI EMBASSY IN WASHINGTON, D.C.

Figure C-6-18

DISCUSSION TOPIC THREE
HANDLING SURGES IN FUTURE

GRUMMAN

- CONTINGENCY OPERATIONS
  - 2 E-8A AIRCRAFT UNTIL IOC ACHIEVED
- CONOPS
- TRAINING
- CONTRACT
  - SUBCONTRACTOR SUPPORT
- GOVERNMENT PRIORITIZATION REQUIRED

Figure C-6-19

DISCUSSION TOPIC FOUR
GOVERNMENT HELP TO ACHIEVE MAX CAPACITY

GRUMMAN

- RATINGS
- INCENTIVES
- EQUIPMENT - SPARES

Figure C-6-20

Desert Storm Operations
Summary

- System performance exceeded expectations
- System reliability & availability exceeded operational requirements

Figure C-6-21

"Another war will not be fought without **Joint STARS**"

Gen M. McPeak
Chief of Staff
United States Air Force
1 February 1991

Figure C-6-22

APPENDIX C-7
VIEWGRAPHS
COMPLEMENTARY BRIEFING
MR. JOHN NOVAK
RAYTHEON

Raytheon

Raytheon Missile Systems Division

Maintaining the Industrial Base for Tactical Missiles

Figure C-7-1

Raytheon Missile Systems Division Segment of Industrial Base

Raytheon

Mission Areas

- Air Defense
- Interdiction ...Precision Guided Munitions

Elements

- Missiles — Ground to Air
  - Ship to Air
  - Air to Air
  - Air to Ground
- Submunitions
- Radars — Ground Based
  - Ship Based
- Fire Control
- C^2 /Commo

Raytheon Missile Systems Division

Raytheon

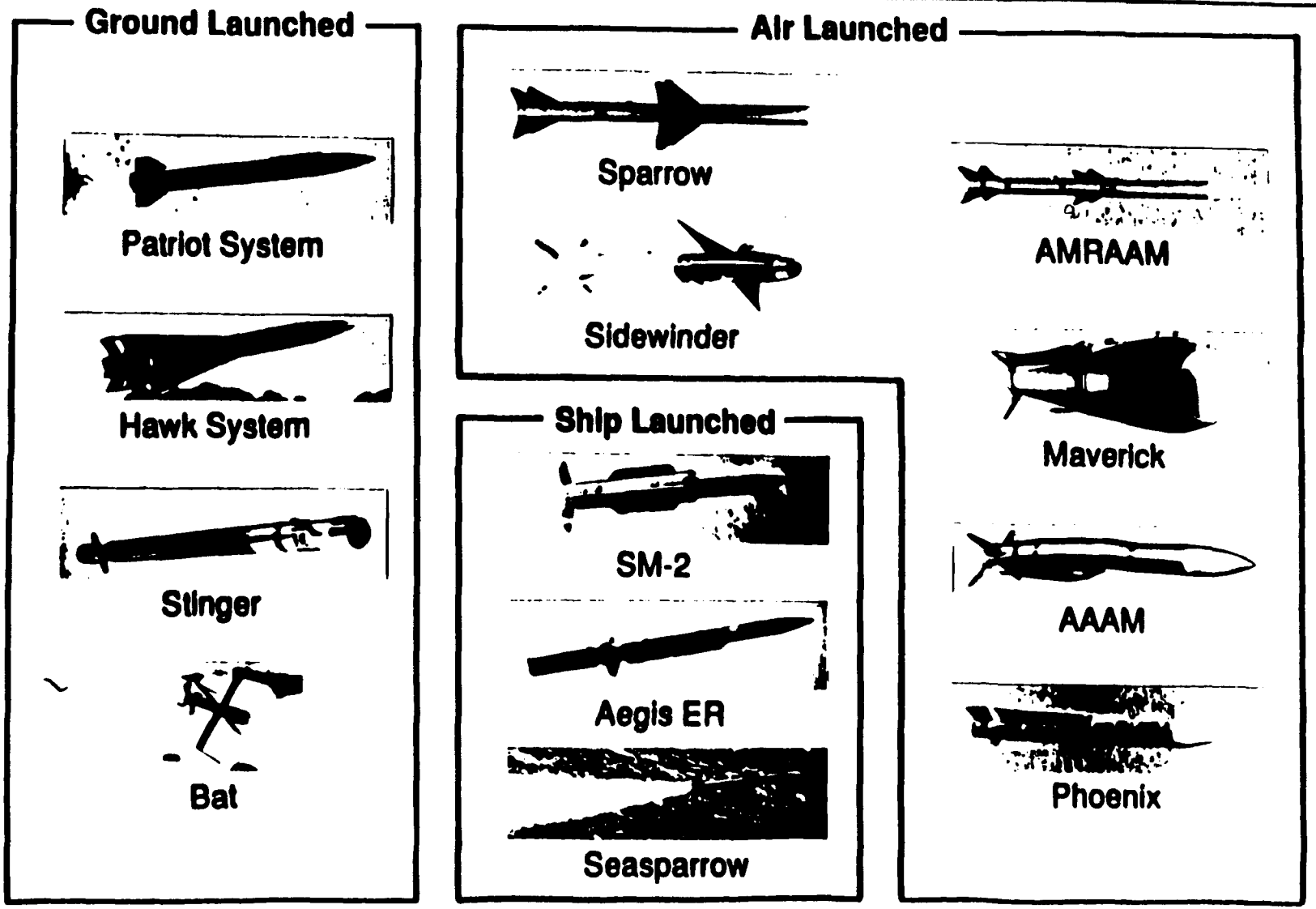


Figure C-7-3

Critical Technologies and Manufacturing Processes for Missile Systems

Raytheon

	Critical Technology	Critical Manufacturing Process		Critical Technology	Critical Manufacturing Process
IR/Radar Domes	√	√	MMIC/MMIC Modules	√	√
Warheads	√	√	Fiber Optics	√	√
S&A Devices	√	√	Displays	√	√
Rocket Motors	√	√	Counter Stealth Technology	√	√
Control Actuation Sys.	√	√	Image Processing	√	—
Thermal Batteries	√	√	Homing Guidance	√	—
Composites	√	√	Autopilots	√	—
Microwave Devices/Assy's	√	√	ECCM	√	—
TWTs	√	√	Data Fusion	√	—
IR Detectors	√	√	Simulation/Modeling	√	—
VHSIC/ASIC	√	√	Ada Software	√	—
Multichip Modules	√	√	Super Computers	√	√

Radomes

Raytheon

Critical Processes

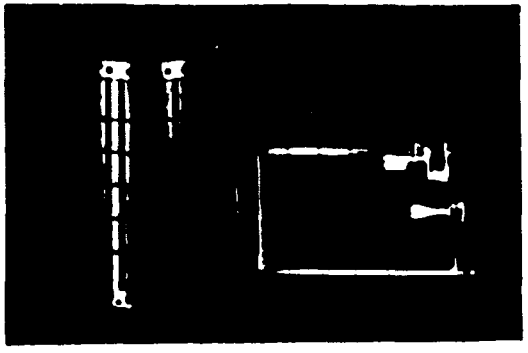
- Radome Lay Up and Billet Fabrication
- Prescription Grinding
- Ring Bonding - Adhesives
- Boresight Testing
- Unique Manufacturing Tooling
- Environmentally Controlled Bonding Process

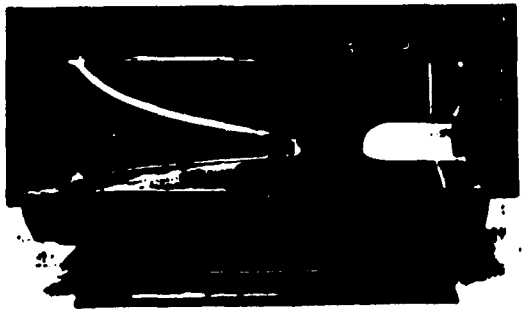
Figure C-7-5

RG92-01-235

Warhead

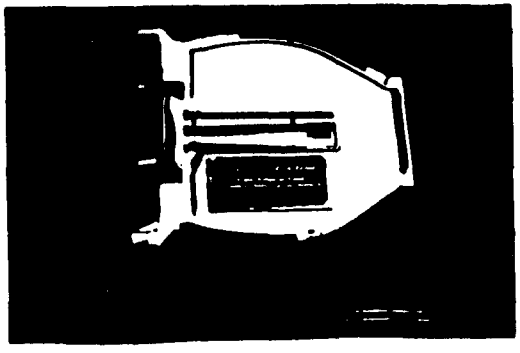
Raytheon





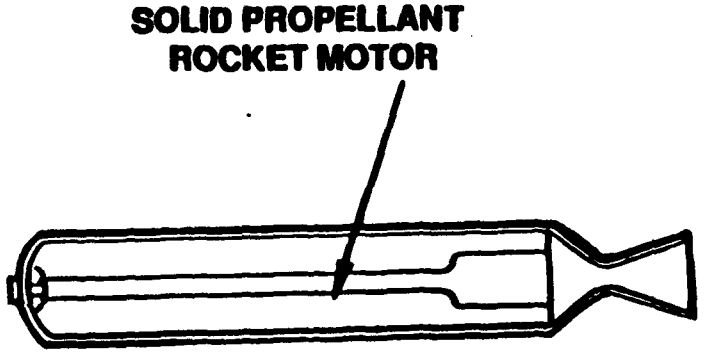
Critical Processes

- Explosive Materials
- Outside Casing and Liner Fabrication
- Explosive Train Assembly
- Loading and Handling
- Tailored Fragments
- Arena Testing



Rocket Motor

Raytheon



Critical Processes

- Motor Case Tooling
- Thermal Liner and Ablative Covering
- Propellant Material
- Machining and Plating Process
- Propellant Loading Process
- Environmental Controlled Manufacture

Figure C-7-1

Thermal Batteries

Raytheon

Critical Processes

- Unique Process Fabrication
- Pellet Pressing
- Unique Raw Materials
  - — Heat Source and Anode
- *Manufacturing Assembly*

Limited Vendor Base

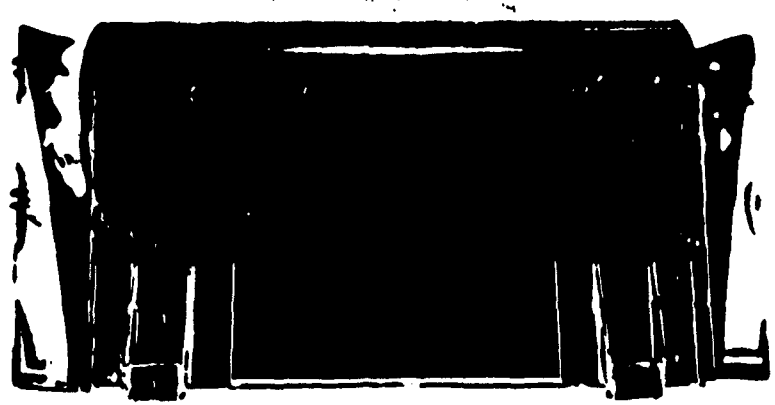


Figure C-7-8

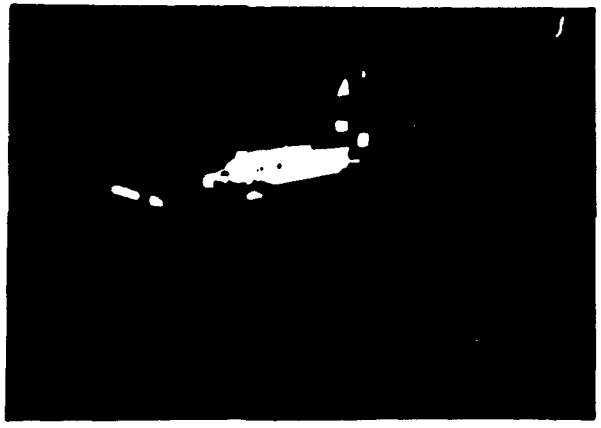
Safe and Arming Devices

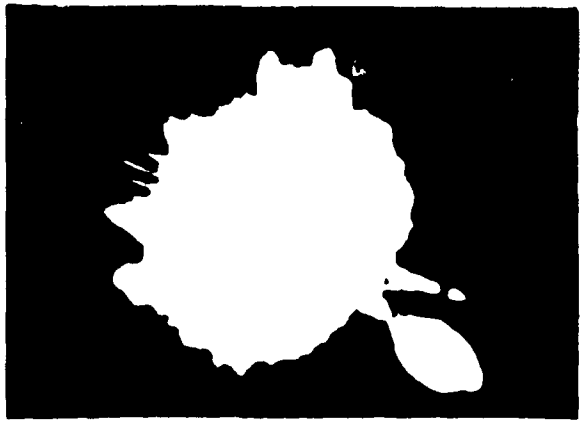
Raytheon

Critical Processes

- Unique Teflon/Metal Plating Operations
- Unique Mechanical/Materials Interface

Limited Vendor Base





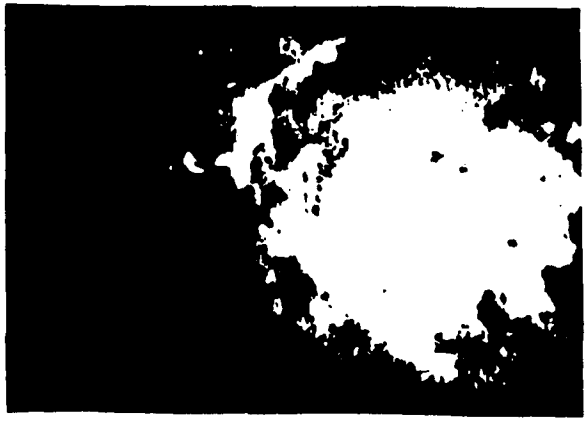
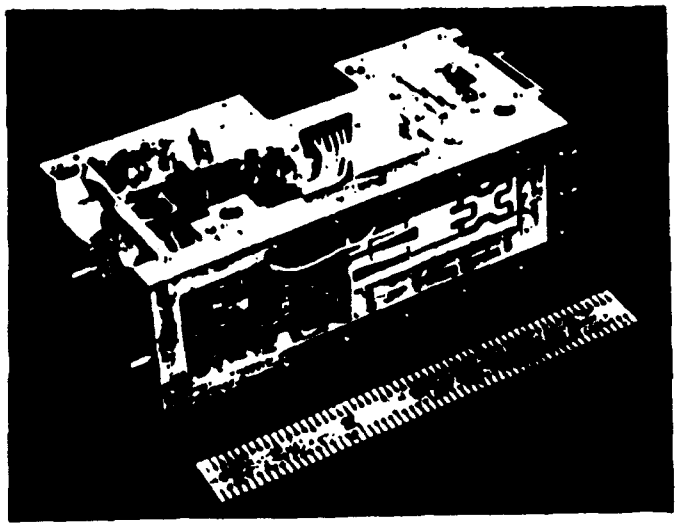
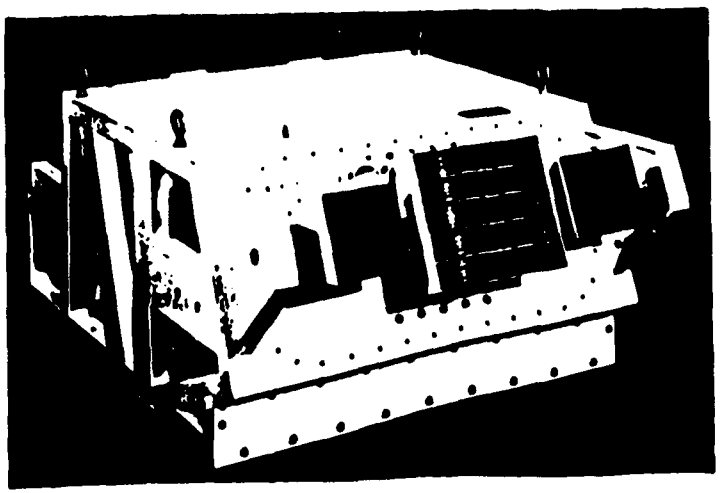


Figure C-7-9 RG92-01-239
1/28/92

Microwave Devices and Assemblies

Raytheon





Critical Processes

- Stripline, Microstrip and Thin Film Processing
- Microwave Components Oscillators, Filters, T/R Devices
- Unique Materials and Processes i.e., Toroids, Ceramics, Garnets
- Element Lenses and Extrusions Require Complex Machining Processes
- Monolithic Microwave Integrated Circuit (MMIC) Technology

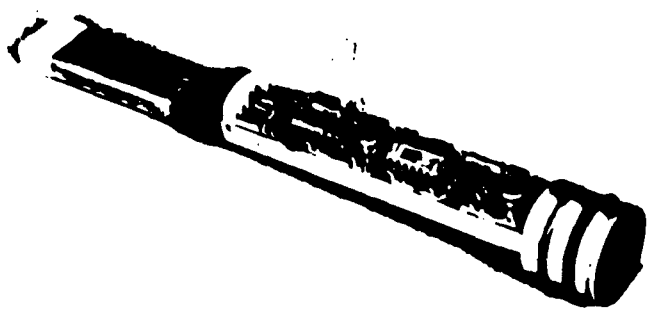
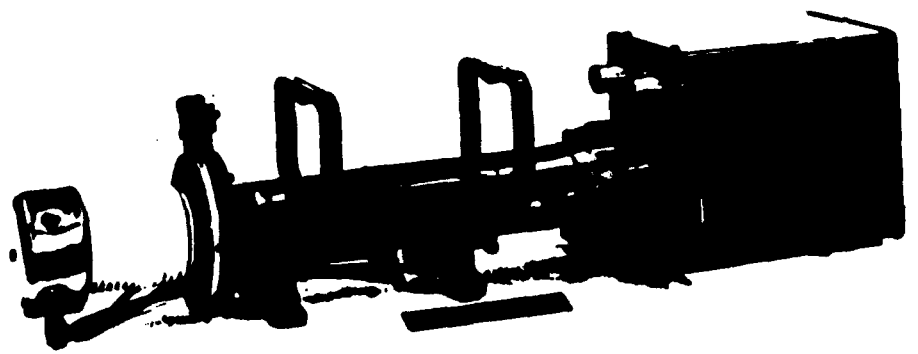
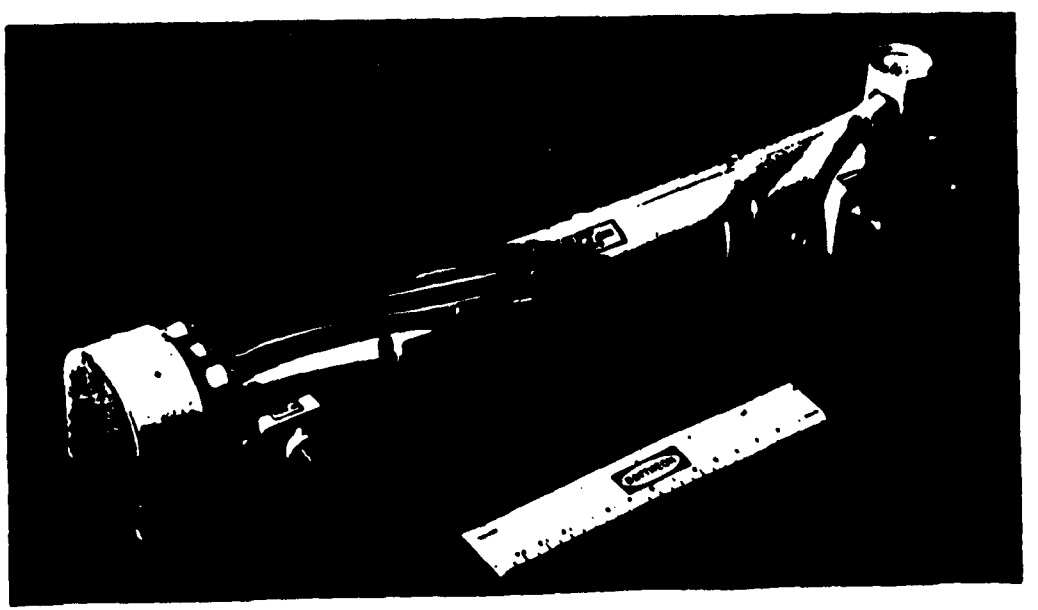


Figure C-7-10

Traveling Wave Tubes Packaged for High Density Missiles and Systems

Raytheon





Critical Processes

- Special Manufacture and Assembly Process
- Fast Warm Up Technology
- Missile Packaging and Environmental Requirements
- Stringent Specifications
- Tight Assembly Tolerances
- Material Process Control
- Environmental Facility Requirements

Figure C-7-11

Strict Tolerance Machined Assembly and Applications

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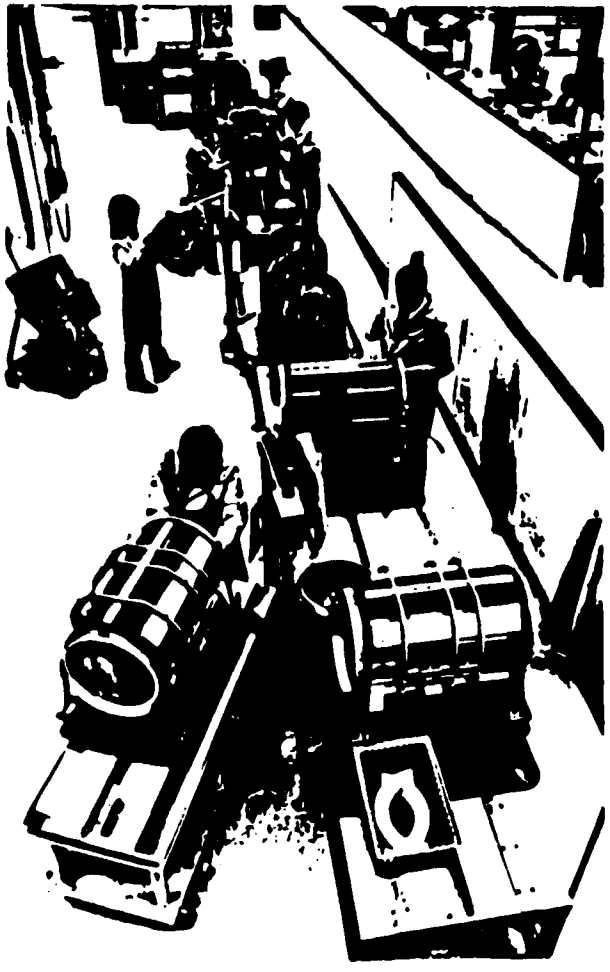
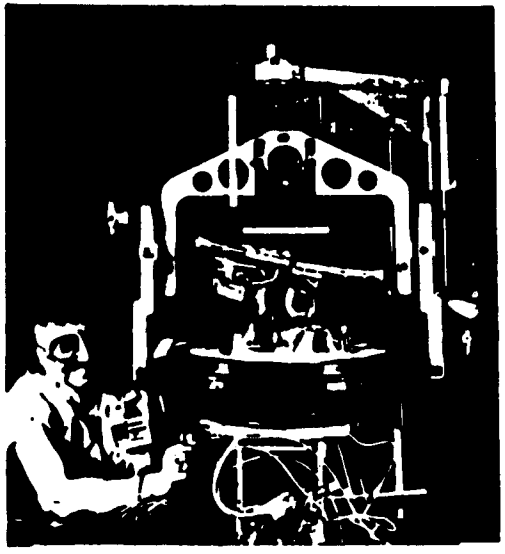
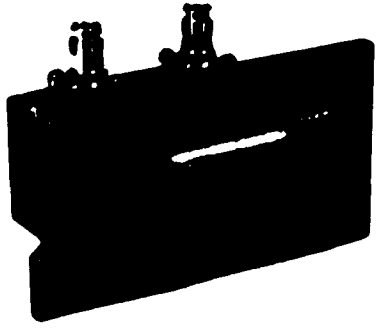




Critical Processes

- Castings - Product Unique
- Forging and Extrusions
- Dielectric Windows
- Transmitter Tanks
- Heat Shield Wrapping
- Ground Based Antenna Structure Tolerance Control
- Integrated Wave Guide Assemblies



Critical Technologies for Future Weapon Systems

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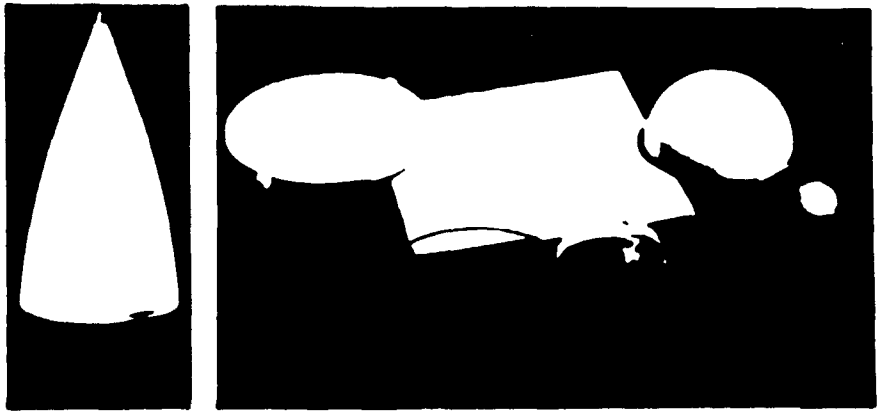
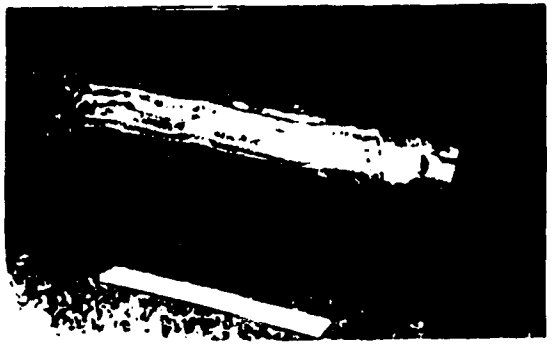
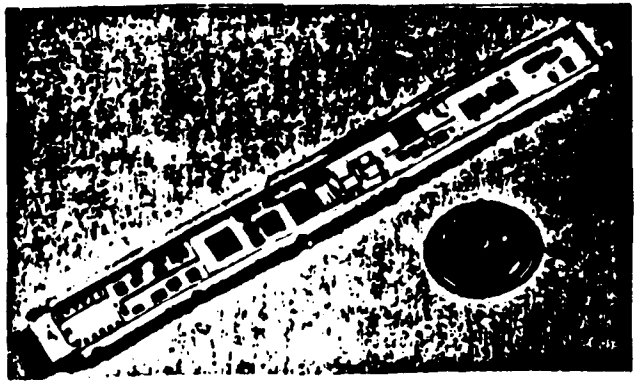


Advanced Material Radomes and IR Domes

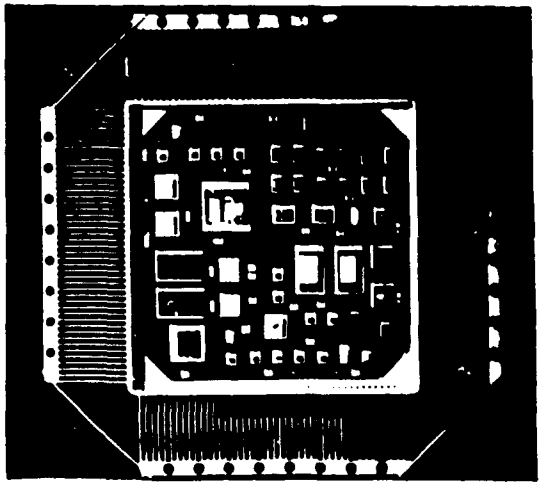
IR Detectors



Composites



MMIC Modules



Multichip Modules

Figure C-7-13

Commercial Availability of Critical Technologies and Manufacturing Processes

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	Critical Technology	Critical Manufacturing Process		Critical Technology	Critical Manufacturing Process
IR/Radar Domes	■	■	MMIC/MMIC Modules	■	▭
Warheads	■	■	Fiber Optics	◇■◇	◇■◇
S&A Devices	■	■	Displays	◇■◇	◇■◇
Rocket Motors	■	■	Counter Stealth Technology	■	■
Control Actuation Sys.	■	▭	Image Processing	■	
Thermal Batteries	■	■	Homing Guidance	■	
Composites	▭	▭	Autopilots	▭	
Microwave Devices/Assy's	■	▭	ECCM	■	
TWTs	▭	▭	Data Fusion	■	
IR Detectors	■	■	Simulation/Modeling	□	
VHSIC/ASIC	◇■◇	◇■◇	ADA Software	■	
Multichip Modules	◇■◇	◇■◇	Super Computers	◇■◇	◇■◇

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Figure C-7-14

Other Availability of Critical Technologies and Manufacturing Processes

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	Critical Technology	Critical Manufacturing Process
IR/Radar Domes		
Warheads		
S&A Devices		
Rocket Motors		
Control Actuation Sys.		
Thermal Batteries		
Composites		
Microwave Devices/Assy's		
TWTs		
IR Detectors		
VHSIC/ASIC		
Multichip Modules		

	Critical Technology	Critical Manufacturing Process
MMIC/MMIC Modules		
Fiber Optics		
Displays		
Counter Stealth Technology		
Image Processing		
Homing Guidance		
Autopilots		
ECCM		
Data Fusion		
Simulation/Modeling		
ADA Software		
Super Computers		

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Figure C-7-15

Critical Issues Which Impact Production Lead Time After Production Restart

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- Component Availability
- Training
- Process Re-Qualification
- Reestablishment of Vendor Base
- Environmental Requirements
- Sunset Parts
- Test Equipment
- Flexible Machinery and Robotics

Figure C-7-16

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Lead Times After Production Stoppage

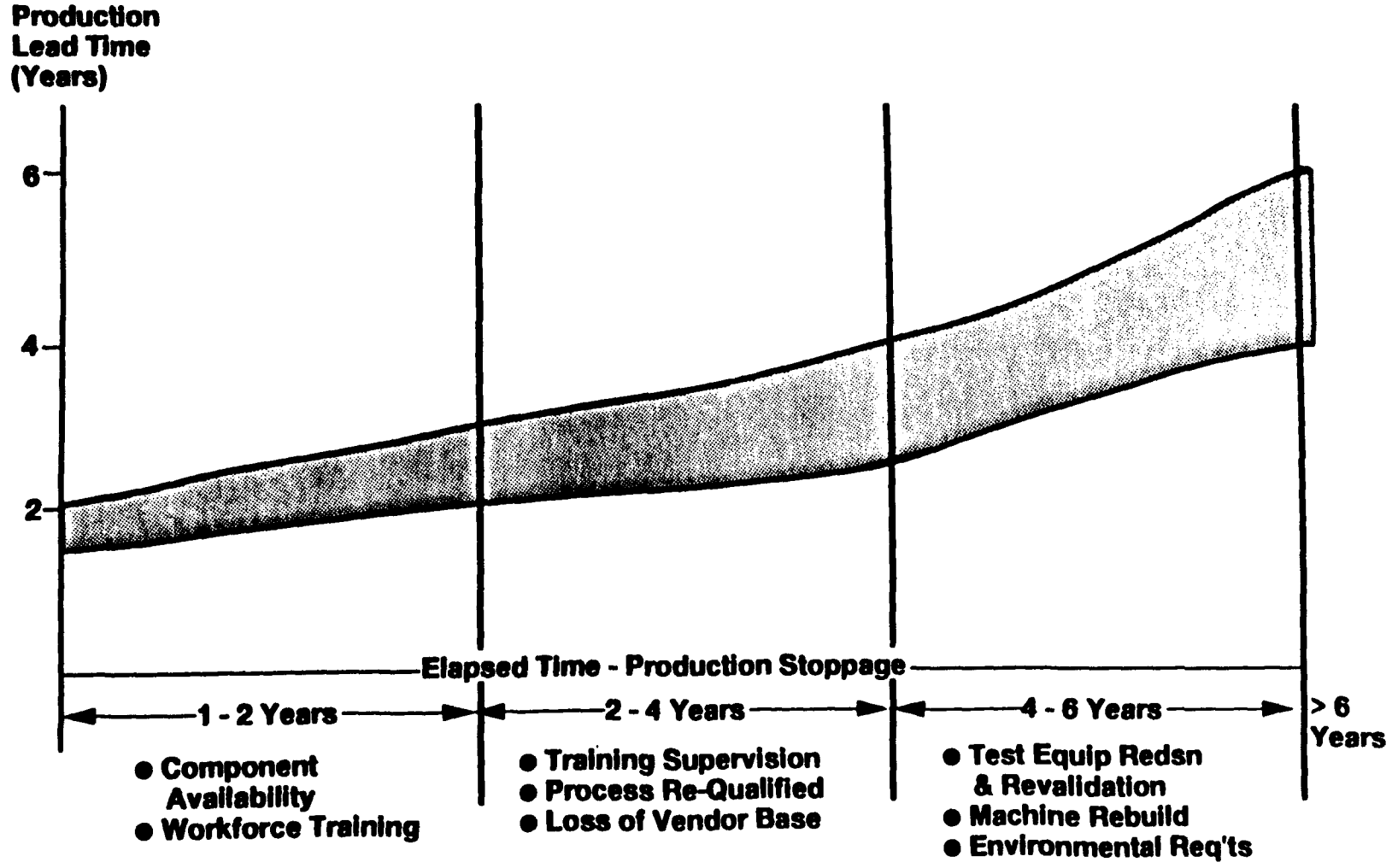

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Figure C-7-17

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Sunset Parts

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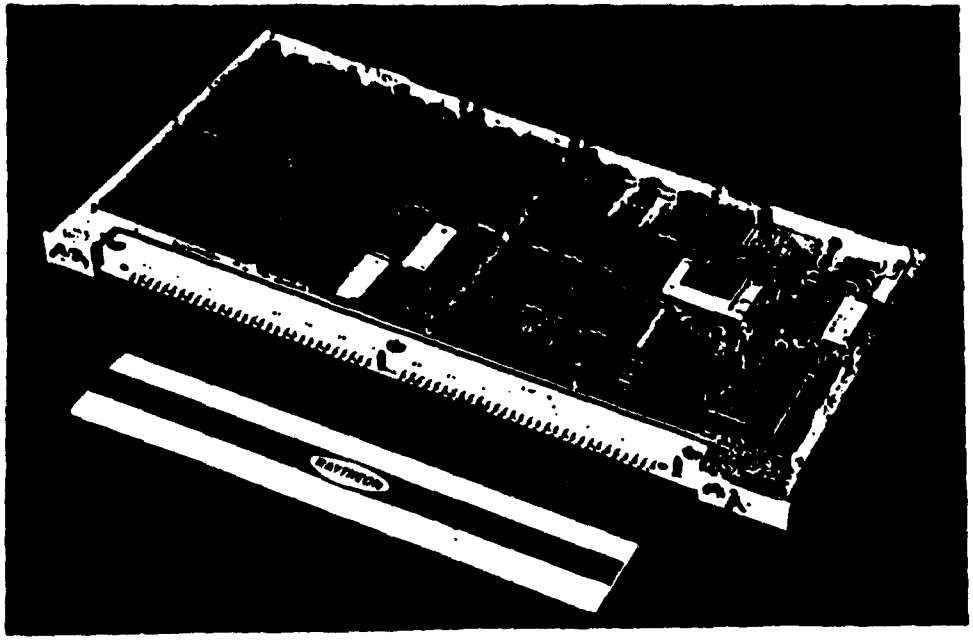
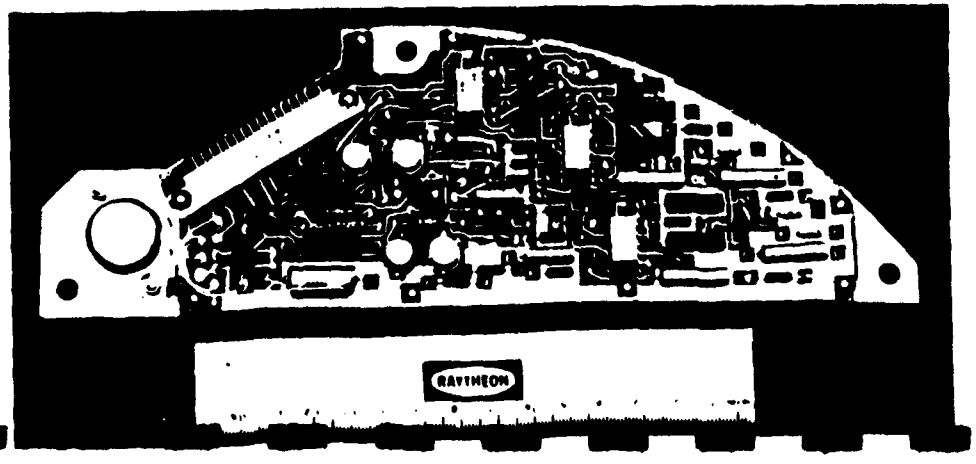


- Discontinued Product Lines - Program Unique
- Hybrids
- Transistors
- Memory Devices
  - —ROM
  - — PROMS
- Integrated Circuits



Systems and Subsystem Test Equipment

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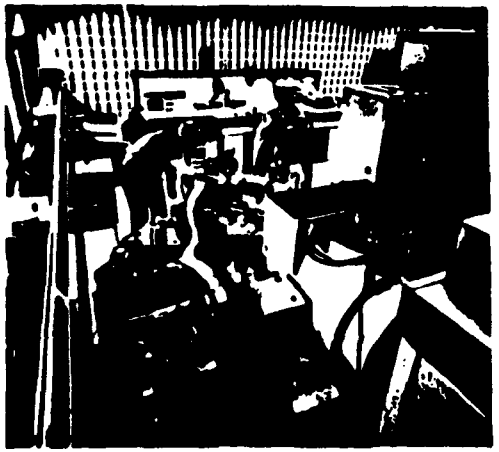

Critical Processes

- Program Specific
- Multi Levels of Assembly and Spec Requirements
- MIL Spec Test Requirements
- Stringent Low Level Test Philosophy
- Emphasis on Thermal and Vibration Testing (LET)
- Maintenance, Calibration and Engineering Support
- Depot Support

Flexible Machinery/Robotics

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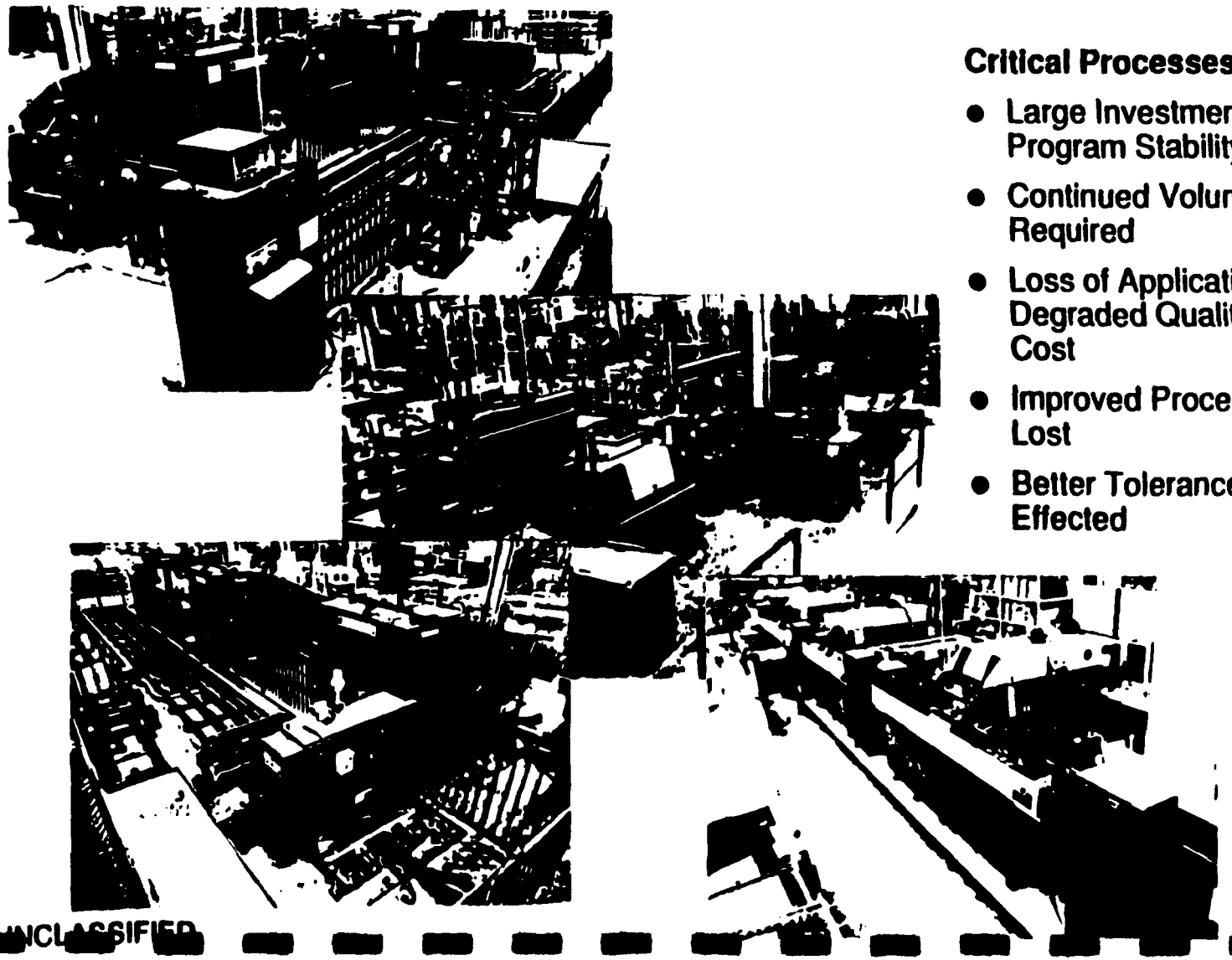

Critical Processes

- Large Investment Requires Program Stability
- Continued Volume Productions Required
- Loss of Applications Resulted in Degraded Quality and Increased Cost
- Improved Processing Control is Lost
- Better Tolerance Control is Effected

Foreign Sales Potential

Raytheon

- Air Defense Systems
  - — High Potential for Foreign Sales
  - — Defensive in Nature
  - — Stabilizing Factor in Volatile Regions
  - — Significant Number of Requests from Foreign Customers

- Interdiction Systems
  - — Moderate Potential for Foreign Sales
  - — More Likely to be Restricted to Limited Number of Allies

Figure C-7-21

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Actions to Facilitate Foreign Sales

Raytheon

- Proactive U.S. Government Support of Overseas Marketing Efforts
  - — Viability of Many Production Lines Dependent on Foreign Sales
  - — More Critical as U.S. Spending Decreases
- U.S. Government Support for Financing of Foreign Sales
  - — Loan Guarantees
- Release Policies which Allow U.S. Companies to Sell Systems with Capabilities Comparable to the Overseas Competition
  - — Foreign Nations Desire Modern Configurations and Technology
- "Replace in Kind" Policies
  - — Sell Inventory where Restrictions on Release of Technology are Appropriate
  - — Replace U.S. Inventory with P^3I Configurations
  - — Underwrites Production Cost of New System Implementation

Figure C-7-22

Desert Shield/Storm . . . A Recent Example of Industrial Base Mobilization

Raytheon

- August 1990 - Immediate Need for Patriot PAC-2 Missiles for TBM Defense in Saudi Arabia

- But . . .
  - — Only 3 PAC-2 Missiles Existed (R&D Units)
  - — First Production Deliveries Not Due Until January 1991
  - — Next Version of Deployment Software Not Planned Until January 1991

- Combined Army/Industry Team
  - — Accelerated Production Missile Deliveries by 5 Months
    - Initial Deliveries at End of August
    - 550 Delivered Before Start of War
  - — Accelerated Testing/Validation of New Software
    - Deployed in August 1990

Figure C-7-23

Keys to Success in Desert Storm Mobilization

Raytheon

- Sustained P3I Program Since Patriot was Fielded
  - —ATM PAC-2 was in Process
  - —Test Program Validated Production Process
- Proven Workforce and Processes
- Adequate In-Plant Production Inventories
- Multiple Sources for Critical Components and Assemblies
  - —Warhead
- Multi Year Contract
  - —Vendors at Full Rate, Raw Material Available
  - —Capital Investment
- Strong National Support

Recommendations to Maintain Missile Industrial Base and Prevent Erosion of Production Lead Times After Shutdown

- Actively Support Foreign Sales
- Promote P^3I Programs to Evolve System Capabilities and Protect Engineering Base
- Ensure That New Technology Developments Extend Through Low Rate Initial Production
- Establish Sustaining Manufacturing Technology Programs
- Consolidate Depot Repair/Maintenance Capabilities and Contractor Production Facilities
- Consolidate GFE and Support into the Prime Contract

Figure C-7-25

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Promote P3I Programs to Evolve System Capabilities and Protect the Engineering Base

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- P3I of Existing Systems Often Far More Effective than New Starts
- Planned Evolutions Insure Technical "Edge"
- Continued Reliability and Performance Improvements
- Engineering/Production Experience Levels Improve Over Time
- Core Technical Team Remains Intact
- P3I Program Should Address Application of Advanced Technology and Research

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Ensure New Technology Developments Extend Through Low Rate Initial Production

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- DoD R&D Policy May Advocate Putting Technology "On The Shelf"
- If Such a Policy Is Adopted, it Must Consider
  - Engineering Development
  - System Testing . . . Including Testing with Other Interoperable Systems
  - Production Processes, Materials, Vendor Base Availability
  - Transition from Development to Production (LRIP)
- Incorporation of "On The Shelf" Technology into Weapon Systems in a Crisis Cannot Occur if the Manufacturing Process Is Not Fully Proven Out
- But Some "Silver Bullets"

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Figure C-7-27

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Establish Sustaining Manufacturing Technology Programs

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- If Production Lines Are Partially or Fully Closed
  - Certain Parts, Processes or Materials Unique to DoD May Not Be Obtainable
  - Single or Limited Sources May Gate Mobilization
  - Capabilities May Depend on Offshore Sources for Specific Items
- Sustaining Manufacturing Technology Programs Should Be Established for Major Systems
  - Continued Production Planning for Mobilization
  - Identify Sunset Parts, Unique Processes
  - Foster Technology for Replacement Solutions
  - Develop New Processes or Parts With Emerging Technologies Having Commercial Analogs
- Add Production Mobilization as a Criteria for Implementing New Parts, Materials, or Processes

Consolidate Depot Repair/Maintenance Capabilities and Contractor Production Facilities

- Overlapping Capability Currently Exists in Contractor Production Facilities and Government Repair/Maintenance Depots

- Lower Budgets for Depot Repair/Maintenance Projected
  - Tough Decisions Must be Made as to the Most Prudent Location for Depot Activities

- Decision to Utilize Contractor Production Facilities for Depot Repair/Maintenance is Important to the Defense Industrial Base
  - Significant Factor in Maintaining Manufacturing Center of Mass
  - Facilitates Retrofits and P3 I Implementations
  - Combines Production and Depot Work for Lower Overall Cost

Consolidate GFE and Services into Prime Contract

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- "Breakback" of GFE and Services into the Prime Contract Insures Total Product Responsibility
  - Government Program Office, One Contractor, One Lead Laboratory
- Responsibility on Prime to Maintain Mobilization Capability
  - Includes Sunset Parts, Processes
- Facilitates System Level Technical Approaches
  - Maintains Center of Mass
  - Essential in Wartime Environment
- Lowers the Overall Program Cost to the Government
  - Clear Cut Warranty Provisions
  - Reduced Support Burden, Personnel

Figure C-7-30

Conclusions

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- The Missile Segment of the Defense Budget
  - —Is Critical to National Security
  - — Has Many Critical Technologies and Manufacturing Processes with No Commercial or Other Sources

- Factors Critical to Maintaining Industrial Base for Tactical Missiles
  - — Proactive Support for Foreign Sales
  - — Pre-Planned Product Improvements
  - — New Developments Programmed Through LRIP
  - — Sustaining Manufacturing Technology Programs
  - — Consolidation of Depot Maintenance / Repair and Contractor Production Facilities
  - — Contractor Responsibility for Total System

Figure C-7-31

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This seminar examined the role of industry in supporting the Desert Shield/Desert Storm Operation, and identified some of the lessons learned from that experience. This was the first of a series of 8 resource preparedness seminars co-sponsored by FEMA, DoD, and IDA in 1992-93. It set the stage for the remainder of the seminars, which considered what preparedness plans, policies, or programs are appropriate to address industrial preparedness issues in the future global environment. Presentations on the industrial support aspects of Desert Storm were provided by top executives from six firms involved in supporting the fighting forces in the Persian Gulf. These firms represent a range of personnel-support items produced in large quantity for the Gulf War (boots, meals, nerve gas antidote injectors, chemical warfare gloves) and two hardware items that proved critical in the conflict (Patriot missile, JSTARS).

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